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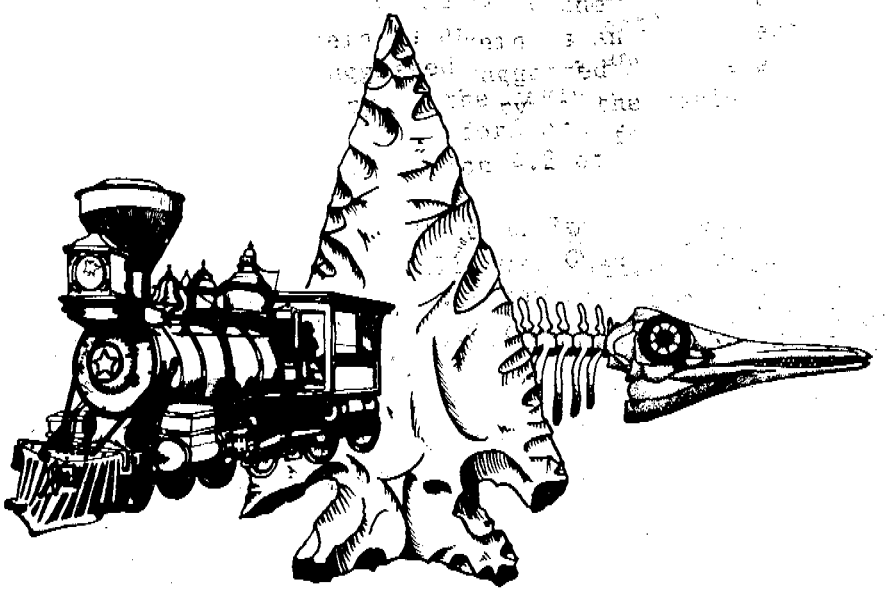

History of Central Nevada:

AN OVERVIEW OF THE BATTLE MOUNTAIN DISTRICT

Martha H. Bowers
Hans Muessig

CULTURAL RESOURCE SERIES No. 4
1982

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No. 4 History of Central Nevada: An Overview of the Battle Mountain District. Martha H. Bowers and Hans Muessig (1982). 209 pp.

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History of Central Nevada:

AN OVERVIEW OF THE BATTLE MOUNTAIN DISTRICT

Cultural Resource Series

Monograph No. 4

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FORWARD

The History of Central Nevada by Martha Bowers and Hans Muessig is the fourth in the series of "Cultural Resources Monographs" published by the Nevada State Office of the Bureau of Land Management and is the result of a contract awarded to Dennett, Muessig and Associates of Iowa City, Iowa, in 1980. The contract was administered by Roberta L. McGonagle, BLM Battle Mountain District archeologist; editing for publication of this, and the previous volumes in the series, was by the undersigned.

Like that of the previous monograph in the series (No. 3: Prehistory, Ethnohistory and History of Eastern Nevada), the geographical scope of the present work is confined to a particular BLM administrative unit, in this case, the Battle Mountain District of the central part of the state. Unlike that study, however, chronological coverage is limited to historic times, the handful of generations between the entry of the first white trappers, explorers and settlers into the study area and the historic present. In keeping with this limitation the authors of this volume are historians rather than archeologists. History has traditionally received less attention than prehistory in Government sponsored "cultural resources" work in the Great Basin and it was thought that an historical emphasis would not only partially redress the balance but was also likely to lead to the development of a framework applicable to future studies beyond the boundaries of Battle Mountain District. The results appear to us to have fulfilled both these expectations.

The main emphasis, of course, is on the major themes which inevitably dominate any serious history of the state: mining, ranching, agriculture and transportation. The authors' treatment of these themes is admirably succinct and well-organized and makes a worthy contribution to the literature of the subject. The History of Central Nevada, however, also has many other virtues. Particularly useful, filling a long-standing need, are the descriptions and discussion of historical archeological remains--houses, ranch, farm and commercial buildings, and mining and other industrial structures. Another, is the attention paid to such neglected topics (neglected, at least, in Nevada and in works of this kind) as rural educational arrangements in the early days and vernacular architecture. The treatment of the latter topic includes a discussion of local building techniques and is especially interesting and rewarding.

A major goal of the monograph series of which this study is a part is to bring together key information on Nevada history and prehistory on a regional basis with a view both to providing a context for the results of future research and to identifying gaps in the local archeological and historical records. It is felt that the authors of the present volume have succeeded admirably on both counts. They have also succeeded in writing an interesting and highly readable work and it is hoped that its readership will be drawn not only from the professional community (government "cultural resources" managers, and professional historians and archeologists) but also from the general public, particularly present-day residents of the study area with an interest in the way of life and considerable achievements of their predecessors and, in many cases, ancestors. It wasn't, after all, that long ago.

Richard C. Hanes, State Archeologist
Fredric F. Petersen, Archeologist
BLM Nevada State Office
Reno
May, 1982

HISTORY OF CENTRAL NEVADA:
AN OVERVIEW OF THE BATTLE MOUNTAIN DISTRICT

By

Martha H. Bowers

and

Hans Muessig

Dennett, Muessig & Associates, Ltd.

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Iowa City, Iowa

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ABSTRACT

The Historic Cultural Resources Overview for the BLM-Battle Mountain District has six major parts, plus four appendices. "The Setting" briefly describes the physical characteristics of the study area, and relates them to aspects of the region's history since the mid-19th century. Two following sections discuss past and current resource investigations in the Battle Mountain District, and also the nature and location of historic research materials. In the fourth section, the historical development of the region is presented, principal themes being industry (mining and non-mining), transportation, architecture, agriculture and settlement. The fifth section provides a synthesis of land use patterns in central Nevada, from the mid-19th century to the present day. The sixth section consists of general recommendations for future historic/architectural resource surveys and data management in the Battle Mountain District. The appendices include a list of mining districts and mineral occurrences, sample historic resource inventory forms from other states, a proposed revision of BLM Historic Site Record Form N6-8111-2, and, finally, an outline of possible research designs and strategies for future study of historic and architectural resources in the Battle Mountain District.

ORIENTATION

The Bureau of Land Management's Battle Mountain District encompasses major portions of Lander, Eureka and Nye counties in the geographical heart of Nevada. The District extends over 200 miles from Battle Mountain to Tonopah, and is nearly 125 miles across at its widest point in Nye county. Three major highways cross the District from east to west: Interstate 80 through Battle Mountain, U.S. 50 through Eureka and Austin, and U.S. 6 through Tonopah. The principal north-south highway is State 8A, from Battle Mountain through Austin to Tonopah. Toiyabe National Forest is located in the west-central part of the District, encompassing large portions of the Shoshone, Toiyabe, Toquima and Monitor Ranges. A segment of Humboldt National Forest is located on the southeastern edge of the Battle Mountain District. The District's southern edge is largely defined by the boundaries of the Nuclear Test Site south of Tonopah.

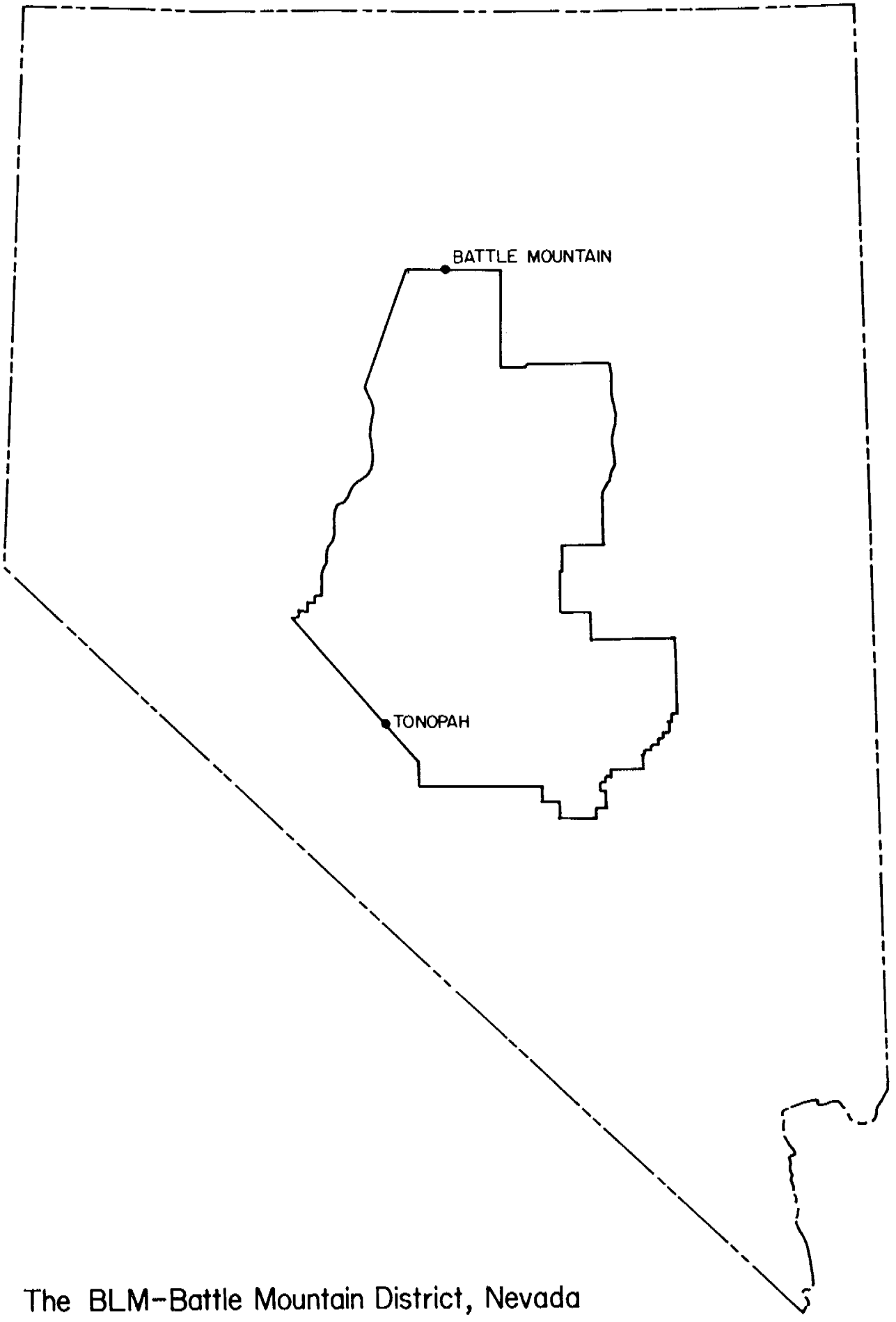
The Battle Mountain District is a land of wide spaces, its small population concentrated in the communities of Battle Mountain, Tonopah, Eureka and Austin. Major economic activities are mining and the range livestock industry; tourism in the area is still limited, but growing. Most of the land is under federal jurisdiction, principal exceptions being mining patents and ranch holdings.

In April, 1980 Dennett, Muessig & Associates, Ltd. entered into a contract with the Bureau of Land Management to prepare a Class I Cultural Resources Existing Data Inventory. The report included a Known Cultural Resources Site Data Compilation and a Cultural Resource Overview, the archaeological components of which were developed by Science Applications, Inc. of LaJolla. The present publication has been adapted from that larger report, with the history and architecture of the Battle Mountain District as the focus.

The original report was prepared under the general supervision of Dr. Roberta L. McGonagle, BLM--Battle Mountain District Archaeologist. The project historians were Martha H. Bowers and Hans Muessig, of Dennett, Muessig & Associates. Marie A. Neubauer and Angela Schiller, also of DMA, prepared maps and graphics.

The investigators owe thanks to many people for their assistance in the course of this project, including Phillip Earl and the staff of the Nevada Historical Society, Reno; the staff of Special Collections at the University of Nevada, Reno; and Charles Kensler, URS/John A. Blume, San Francisco. Thanks are due also to Patrick Welch, formerly of the BLM-Battle

Mountain District archaeological staff for his comments on portions of this report; to Lowell J. Soike, Chief of the Historic Site Survey of the Iowa Division of Historic Preservation for his advice and criticism; and to Roberta McGonagle for her patience, responsiveness and guidance.



Map 1: The BLM-Battle Mountain District, Nevada

COLLECTIONS

The principal repositories for Nevada primary source materials (contemporary documents, manuscripts, maps, photographs, and published works) are the Nevada Historical Society (Reno), the Nevada State Library (Carson City), the libraries of the University of Nevada (Reno), and the Bancroft Library (Berkeley). Nevada materials are also held by the Huntington Library (San Marino), Yale University (New Haven), the Newberry Library (Chicago), the California State Library (Sacramento), and the Wells Fargo Bank (San Francisco). For the purpose of cultural resource investigation, however, the Nevada repositories contain the bulk of the most useful material. Together, the Nevada institutions hold a very large quantity of information, but it varies considerably in depth. Mining is the most heavily covered topic, while materials on other important subjects, such as agriculture, transportation, social and cultural institutions, and architecture, are either very limited or wholly lacking.

Most important of the Nevada repositories is the Nevada Historical Society. Here may be found a good collection of maps (including Sanborn Fire Insurance Company maps of major towns, maps of mining districts, and railroad and government surveys) and a very fine selection, on microfilm, of local newspapers, ranging from Virginia City to Betty O'Neal and Round Mountain. The Society's manuscript collection (for which there is a published catalog) is large, and features such items as business records, oral histories and reminiscences, contemporary documents such as tax receipts and brand records, and the personal and business papers of important Nevadans. In addition to a good selection of published secondary works on Nevada history, the Society holds an extensive photograph collection. The hundreds of images (grouped roughly by subject, and as yet not thoroughly catalogued) include both historic and recent views. They constitute an important visual record of the state's communities, landscape, mining history and agricultural life.

The University of Nevada, Reno, libraries form another valuable source of information. The large serials holdings of the mining library include many articles (usually quite technical) on Nevada mining; most useful of these are reports and publications of the University's own School of Mines.

The Fleischmann library contains reports of the University's Agricultural Extension Service, and also many federal publications on ranching and other agricultural activities. The main library holds theses and dissertations on various aspects of Nevada history, and a full range of published works. Most valuable is the Special Collections Department. The catalog here is very good, and includes maps, photographs, manuscripts, a special listing of Nevada materials located throughout the University's library system, and also a catalog of Nevada materials held at other institutions. The range of materials, however, does not equal that of the Historical Society. Maps generally cover wide areas of the West, and thus do not contain the local information most useful in cultural resources work. The photograph collection is smaller than the Society's, and emphasises the Comstock: thus there are few images from the Battle Mountain District.

The Nevada State Library, Carson City, is the repository for published state documents. Historically, Nevada state government saw little need to publish extensive reports on the activities of its officials, departments and agencies, so the resulting coverage is somewhat uneven. Particularly useful, however, are reports of state agencies appended to the biennial reports of the state legislature. These agency reports are also bound together by department or agency. Of greatest potential use are reports from the Superintendent of Public Instruction, Secretary of State, Labor Commissioner, the State Engineer, Bank Examiner and Surveyor General. The Library has an extremely limited map collection, and no photograph collection. The Library's Nevada Room, however, is worth noting. This room holds a broad collection of published secondary works on state history, including city directories, magazines, books and pamphlets. Much of this material is available at other institutions, but in the Nevada Room it is housed in open (rather than closed) stacks, which from the researcher's point of view are excellent for browsing.

The Nevada State Archive (Carson City) also contains state government publications. However, the Archive is not really set up as a public research institution, being, instead, a reference facility for the state legislature. At the State Land Office (Carson City) are the original maps and notes from the 19th century township surveys of Nevada.

As noted above, the collections of Nevada institutions constitute by far the most useful sources of information for cultural resource investigation, particularly for the Battle Mountain District. At the University of California's

Bancroft Library, the most useful items are the Mining and Scientific Press (which feature, among other things, articles on technological developments and reports on mining activity throughout the West) and reports of major mining companies (many of which are on microfilm and thus available through interlibrary loan). The Bancroft's map and photograph collections, while extensive, place emphasis on California, the West at large, and, in Nevada, on the Comstock. The Wells, Fargo Bank's History Room is of very limited usefulness with regard to the Battle Mountain District. The company's business records are not open to the public, and its collections are heavily biased in favor of California.

PAST AND CURRENT INVESTIGATIONS

Historical investigations within (or including) the Battle Mountain District have to date taken two forms. The first, represented by Welch (1979) and Goodwin (1966) is the historical narrative, organized more or less thematically. Goodwin's work is developed around the Humboldt River and its sub-basins, and only the sections on the Battle Mountain, Reese River, and Pine Valley sub-basins are pertinent to the Battle Mountain District. Goodwin's emphasis is on trails, railroads and mining. He provides an enormous amount of detail, but it is not always well organized nor always pertinent to an understanding of past or existing cultural resources. Welch covers more territory, geographically speaking, and his narrative is more readable than Goodwin's. Whereas Goodwin's practical intent is not entirely clear, Welch has at least attempted to place known cultural resources within some historic context. Welch's observations on the nature of available documentation, and the resulting bias in his (and other writers') work toward mining and the 19th century, are well taken. The principal shortcoming of these studies is that they simply assemble data. There is no attempt to evaluate the data nor interpret them in terms of understanding the potential significance of a given cultural resource or group of resources.

The second form of historical investigation to have included areas of the Battle Mountain District is exclusively site-oriented. The BLM's own, on-going inventory consists in large part of recording resources as found in the course of regular field work. Many of these resources have not been researched, but have simply been described and mapped. Others have not been visited at all. Exceptions are sites included in the Bureau's Recreation Inventory System, which have been researched, although to a very limited extent. Another "field oriented" investigation is that being carried out by URS/John A. Blume & Associates (San Francisco) for the Department of Energy. Although this investigation (on-going since 1965) is for the purpose of determining effects of ground motion (from underground nuclear testing) on structures of all types and ages, it has resulted in three documents of limited distribution that among other things record physical characteristics of many historic resources.

While the historic site recording projects of BLM and URS/Blume tend to emphasize site description over library research, other projects err in the opposite regard. Mordy and McCaughey's (1968) inventory of historic sites contains good, though brief, data, but lacks, or gives only very cursory attention to, information on the sites as they

presently exist. Texas Tech's Nevada Historic Engineering Site study (1979-80) has also not benefited from field investigation, except in a very few cases, mostly in and around Virginia City. Given the continuing attrition of Nevada's cultural resources, the lack of proper descriptive data is a serious shortcoming. It is, however, understandable, since these resources are scattered throughout an enormous land area, in difficult terrain and often accessible only by foot, horseback, or four-wheel-drive vehicle.

The formal recognition of historic resources is limited for the most part to the National Register of Historic Places and the Nevada Historical Markers Program. National Register properties within the Battle Mountain District number only eight (four are in process), a number which does no justice to the area's historical resources. The State Marker Program selects sites using criteria largely based upon those for the National Register. These sites are given interpretive markers and in some cases, fences to inhibit (if not prevent) vandalism. The list of marked sites is periodically updated, and the State Historic Preservation Office publishes guidebooks on the sites for interested Nevada residents and tourists.

While the historical investigations described here have their merits, they do not, individually or collectively, function adequately as tools for comprehensive and informed historic cultural resources identification. Such an identification program should combine, in equal measure, systematic field investigation, physical inspection and description by qualified professionals, photographic recording, historical research (both site-specific and contextual) and rigorous evaluation of each resource or group of resources in terms of integrity, historical association, and architectural form. One or another of these elements is found in each of the projects described here. However, only the BLM's Cultural Resource Evaluation System (CRES) makes any attempt to evaluate resources according to formal criteria or guidelines, and application of this system (which emphasizes levels of protection to be given various sites) has been seriously hampered by lack of adequate data from which to make informed judgments. To its credit, BLM has not assigned CRES ratings arbitrarily, but the very large number of resources rated SO (insufficient data) does not form a particularly useful data base for management.

Besides methodological shortcomings, these various historical investigations also lack, for the most part, coherent research design. This lack in URS/Blume's work is understandable, since Blume's recording projects are

fundamentally ground-motion, rather than cultural resource, studies. Welch's overview of the BLM Shoshone and Eureka planning districts is the best historical treatment of the area to date, but as Welch himself recognizes, it is only an introduction. Goodwin overwhelms the reader with historical trivia, and his work is largely useless as a planning document. Mordy and McCaughey offer simply a descriptive list (much like Stanley Paher's Nevada Ghost Towns and Mining Camps (1970)) of places, useful as a reference but again not grounded in serious historical analysis. While it has collected some worthwhile information, Texas Tech's historic engineering site survey lacks an overall framework for identification and selection of sites, and did not include an adequate program of field investigation.

None of the past or current historical investigations in the Battle Mountain District has addressed the fundamental problem of how to distinguish historic resources from historical remains. The various researchers and investigators have produced lists of towns, camps, mines, roads, ranches and other sites, with a number of such remains recurring repeatedly; but the reasons for including any given site are not clearly stated, or not discussed at all. A site does not achieve historic significance simply by having existed at some time in the past. An historically significant resource must demonstrate qualities of integrity, proper degree of association with persons. events or developments of documented, and rigorously analyzed, importance, and/or must contribute substantially and clearly to an understanding of past lifeways and material culture. To date, a framework for applying these criteria has not been established for the Battle Mountain District.

Treatment of the Battle Mountain District's cultural resources as architecture has been almost totally neglected. Given the fact that few structures within the District demonstrate the architectonic forms and attributes considered important within the academic community of architectural historians, this is understandable. Vernacular, or folk architecture tends to fall "between the cracks" of traditional architectural history and traditional historical writing, but this is a shortcoming of those disciplines, rather than of vernacular architecture. Of all the historical investigations known to have included the Battle Mountain District, only URS/Blume's have addressed cultural resources from the architectural viewpoint. URS/Blume has even developed a preliminary typology for vernacular architecture within its study area, although the firm has not gone beyond basic description of various architectonic forms and use of materials. While only a beginning, this work deserves

further consideration as a possible basis for developing an understanding of the Battle Mountain District's historic architectural resources.

CULTURAL RESOURCE RESEARCH AND INVESTIGATION PROJECT SUMMARY

1. Project Title: Nevada Historic Engineering Site Inventory

2. Principal Investigator(s): Dr. Joseph E. Minor (director, History of Engineering Program, Texas Tech University, Lubbock). Also Donald Abbe, et. al. staff researchers.

3. Sponsoring Institution: Heritage Conservation & Recreation Service, through the Nevada Division of Historic Preservation; and Texas Tech

4. Dates of Field Work: 1979

5. General Location of Field Work: State of Nevada

6. Purpose of Field Work: To develop a computerized inventory of significant historic engineering sites in the state of Nevada.

7. Field Procedures and Techniques:
-mailing of questionnaire to knowledgeable persons in Nevada
-preliminary research to identify potential sites
-selection of a limited number of sites for field investigation
-storage of basic information in machine-retrievable form

8. Project Results:
-computer printout inventory of over 1000 historic engineering sites in Nevada
-preparation of several National Register nominations for submission to the Nevada SHPO
-individual site files of documentary and field information

9. Evaluation of Project: Because the inventory was developed principally through secondary library research (Paher (1970) for example), the survey lacks both comprehensiveness and field data. Survey is biased toward the larger towns and mining districts, and includes many "obliterated" sites at the expense of yet-unidentified sites that may be far more intact, and thus of more use in developing an understanding of the varieties of technology to be found in Nevada's historical past.

10. Records (i.e., reports, notes, and collections): Field notes, photographs, research materials are available in the History of Engineering Program, Texas Tech University, Lubbock.

CULTURAL RESOURCE RESEARCH AND INVESTIGATION PROJECT SUMMARY

1. Project Title: Recreation Inventory System (Sightseeing)

2. Principal Investigator(s): BLM staff

3. Sponsoring Institution: BLM, Battle Mountain District

4. Dates of Field Work: On-going

5. General Location of Field Work: Throughout Battle Mountain District

6. Purpose of Field Work: To identify, describe, and evaluate (for sightseeing potential) cultural resources that appear to have historical significance or interest.

7. Field Procedures and Techniques:
-background historical research
-site investigation, description, photographs

8. Project Results: A series of short descriptive reports on several hundred sites of potential public interest, ranging from mining camps to ranches, roads, ruins, and stagecoach stations. Presumably these reports can be used in developing plans for historic site interpretation, sightseeing, etc. The Tonopah Planning Unit's summary is separate from that of the Shoshone-Eureka unit.

9. Evaluation of Project: Does not pretend to be a comprehensive summary of the district's cultural resources, but does contain some good descriptive information. Photographs are simply color snapshots, and do not serve as a proper photographic record of the buildings and structures, but do serve as information sources for the immediate future.

10. Records (i.e., reports, notes, and collections): Field notes and photos for Shoshone-Eureka areas are on file at the Battle Mountain District office, as is a copy of the Tonopah URA report. Field notes and photos for the Tonopah URA are at Tonopah.

CULTURAL RESOURCE RESEARCH AND INVESTIGATION PROJECT SUMMARY

1. Project Title: Nevada Historical Sites

2. Principal Investigator(s): Brooke D. Mordy and Donald McCaughey, Western Studies Center, Desert Research Institute

3. Sponsoring Institution: State of Nevada, Department of Conservation & Natural Resources

4. Dates of Field Work: 1967-68

5. General Location of Field Work: State of Nevada

6. Purpose of Field Work: To provide a basic, beginning inventory of Nevada's historic resources; to incorporate a portion of this work into the state's Historic Preservation Plan (Volume II).

7. Field Procedures and Techniques:
-literature search
-photographic recording

8. Project Results:
-an inventory of approximately 1000 sites, located in all parts of the state (including Lander, Nye and Eureka Counties); published as Nevada Historic Sites in 1968 by the University of Nevada, Reno.

9. Evaluation of Project: Emphasis is on the towns and townsites featured in nearly every other local historical work on Nevada. Brief historical accounts, lacking useful information about past or existing condition of physical remains. No architectural discussion. The work serves as a handy reference, but does not in any way function as a proper inventory or planning tool.

10. Records (i.e., reports, notes, and collections):
-photographs and research notes on file at Desert Research Institute

CULTURAL RESOURCE RESEARCH AND INVESTIGATION PROJECT SUMMARY

1. Project Title: Survey of Historic Sites: Southern Nevada and Death Valley (JAB-99-121) (1980, draft)

2. Principal Investigator(s): Charles Kensler, URS/John A. Blume & Associates, Engineers, San Francisco

3. Sponsoring Institution: DOE-Nevada (Las Vegas)

4. Dates of Field Work: 1977 (principally)

5. General Location of Field Work: Central-southern Nevada, west into Death Valley

6. Purpose of Field Work: To compile an inventory of 19th and early 20th century buildings and structures that appeared to have some cultural value, to record these and to evaluate the effect of ground motion from underground nuclear testing upon them.

7. Field Procedures and Techniques:
   -extensive interviews with local persons, groups, agencies knowledgeable about the area
   -background secondary-source examination, using such works as Angel's and Elliott's histories of Nevada, and Paher's book on ghost towns
   -field inspection, utilizing helicopters, airplanes and four-wheel-drive vehicles; recording of structures including measurements, detailed description of materials and methods of construction; extensive photographic coverage

8. Project Results:
   -limited-distribution (for official use only) report, still in draft form, that presents the building descriptions, brief historical data, and an introduction that attempts to develop a typology for some of the area's vernacular architectural remains.

9. Evaluation of Project: This is by far the best historic site investigation to have been conducted in the Battle Mountain District. Sites are carefully described in a professional manner, and often are placed in historical context. The introduction includes a brief, but highly pertinent, discussion of materials and methods of construction.

10. Records (i.e., reports, notes, and collections): Field notes, photographs, interview transcripts on file at URS/Blume, San Francisco.

CULTURAL RESOURCE RESEARCH AND INVESTIGATION PROJECT SUMMARY

1. Project Title: Inventory of Structures: Southern Nevada; Inventory of Structures; Central Nevada

2. Principal Investigator(s): Various staff of URS/John A. Blume and Associates, Engineers (San Francisco)

3. Sponsoring Institution: DOE-Nevada (Las Vegas)

4. Dates of Field Work: 1964-69

5. General Location of Field Work: South and Central Nevada

6. Purpose of Field Work: To locate, document and observe structures and facilities surrounding the Nevada Test Site and the Nuclear Rocket Development Station, for the purposes of evaluating the possible effect of ground motion resulting from nuclear or rocket testing.

7. Field Procedures and Techniques: Interviews with representatives of public agencies, private organizations, and individuals; on-site inspection for description and photographing of resource.

8. Project Results: Two reports, JAB-99-43A and JAB-99-44A, which have limited distribution, and which include, among other things not germane to a cultural resources overview, brief physical descriptions of buildings and structures, estimated construction dates, and locational information given in terms of latitude and longitude.

9. Evaluation of Project: It is not clear from the information made available to this researcher just how sites had been selected for study. The chief value of these first two reports (see summary of URS/Blume's "Survey of Historic Sites: Southern Nevada and Death Valley") is that they provide some useful information about building types and materials found in the areas of their concern. Lack of photos in the reports is a problem.

10. Records (i.e., reports, notes, and collections): Field records, photographs, and other materials are on file (but not, we believe, available to the public) at URS/Blume, San Francisco.

CENTRAL NEVADA: A THEMATIC INTERPRETATION

The Setting

Central Nevada lies in the western portion of the Great Basin, a region of block-faulted mountain ranges oriented primarily in a north-south direction. Lower spurs branch between the major ranges, forming enclosed basins and long, broad valleys, most 5000 feet or more above sea level. Considered a true desert, the region receives little rainfall (often less than 10 inches per year) due to the barrier against Pacific stormfronts formed by the Sierra Nevada along the western edge of the state. The climate is thus quite dry, with bright, hot summers and often harsh winters. Soils of central Nevada vary according to such factors as parent rock, degree and direction of slope, drainage characteristics and amount of rainfall. Most common are well-drained gravelly soils, coarse to medium in texture, that form on the lower reaches of alluvial fans and on portions of the valley floor. Where the land is flat, soils are silty deposits from prehistoric lakes, often strongly saline-alkali affected and barren of plant life.

Dominant forms of natural vegetation are shadscale and sagebrush at lower levels, with pinyon and juniper occurring at 5000 to 8000 feet, often with an understory of sagebrush. Hardy grasses, such as bunchgrass, often grow with, and sometimes dominate, sagebrush. Along watercourses, scattered stands of willow or cottonwood may also be present.

The physical characteristics of the central Nevada landscape greatly influenced the nature of the activities that constitute the Battle Mountain District's history since the mid-19th century. An arid land covered mostly by sagebrush permitted little agriculture in the crop-raising sense, but was sufficient for grazing. Lack of adequate moisture and rich grasses inhibited development of a dairy industry: the ranges were suitable only for hardy beef cattle and sheep.

As in other places and other times in American history, settlement patterns in central Nevada were largely determined by the location of fresh water. Ranches were established at springs, and in the foothills where streams flowed down from the mountains. Mining camps and towns, however, were located where ore was found, within the mountain ranges. Many suffered from lack of sufficient water to meet human and industrial needs. In those circumstances, camps were either short-lived, or acquired water through construction of pipelines and aqueducts.

Geologic activity, particularly during the late Tertiary period, has had a profound impact upon central Nevada history. The upthrust of the fault-block ranges, in chains running north-south, was accompanied by mineralization that left rich deposits of gold--and above all, silver. As a result, much of the history of Nevada is centered around the history of mining--the extraction and processing of ores. Unlike California in the 1840's and 1850's, however, where gold was often found in easily-worked placer deposits or readily processed with stamp mills, Nevada's silver required high degrees of capital investment and sophisticated technology. The basic fact--that silver was particularly difficult to extract and required extensive processing--meant that Nevada mining history would be characterized by technological innovation, such as amalgamation and smelting; by high proportions of foreign-born miners from such areas as Wales, Ireland and Cornwall that had long histories of mining activity; and by almost "factorylike industrial relations" between corporate owners and the miners (Paul 1963:57).

Like water, wood was also a scarce resource in central Nevada, limited largely to the pinyon and juniper of the mountain ranges. Charcoal kilns, still to be found in the District, represent one of wood's most important economic roles in the area's history--as a source of charcoal to fuel the ore smelters. The scarcity of wood played a role in encouraging the development of a few rather large smelters, rather than many small ones, thus contributing further to the corporate character of Nevada's mining history. Limited supplies of wood for building resulted in another phenomenon: as people left one dying mining town for one with better prospects, they often dismantled their houses and store buildings, and reconstructed them at the new site.

The character of the land has thus constituted the principal factor in the way central Nevada has developed since the first explorers followed the Humboldt across the country to California. This theme will move like a thread through the larger thematic treatment that follows. Although the impact of this severe climate has been to some extent mitigated by transportation and technological developments, the land is still desert country, and its history and the lifeways of its inhabitants, past and present, must be understood within the environmental context.

Exploration

"I started about the 22nd of August 1826, from the Great Salt Lake . . . for the purpose of exploring the country S.W. which was unknown to me . . ." (Goetzmann 1966:130)

The written record of Anglo-American exploration in central Nevada begins with this letter from Jedediah Smith to William Clark, then superintendent of Indian Affairs in St. Louis. Smith, a trapper and partner in the Rocky Mountain Fur Company, reached California late in 1826, after a journey which took him south from Salt Lake to the Colorado, then along the river to the Mojave valley, where he entered California. Smith's return passage, in the spring and summer of 1827, included travel in a northeasterly direction from near Walker Lake, on a route roughly corresponding to today's US 6 across the southern portion of the central Nevada region (Goetzmann 1966:133-4).

Smith's route was one of three major east-west roads through central Nevada in the 19th century, and though it was first recorded, it was the last to be developed. More promising was the Humboldt valley, explored by Smith's Canadian rival Peter Skene Ogden in 1828-29, and retraced in 1833 by Joseph Walker (Goetzmann 1966:136, 151). The Humboldt was, of the two routes, by far the most direct and hospitable path to California. Its utility as an emigrant route to the Pacific was demonstrated by the Bidwell-Bartelson party in 1841, followed by J. B. Chiles going east in 1843 and the Stevens-Murphy party in 1844. Seven years later, George Chorpenning opened the first California-Salt Lake mail route through the Humboldt valley (Hafen 1926:63-66, Welch 1979:8).

While the first two routes across central Nevada were first recorded by trappers and traders seeking new sources of beaver and other furs, the third was located by another breed of explorer. From about 1840, exploration in the far west was "characterised by its clear relationship to national political and economic aspirations" (Goetzmann 1966:232). The federal government directed these quests, and the soldiers, scientists and engineers who conducted them had very specific questions to ask of the land. In the 1840's basic problems included establishing relations with Indian tribes, locating military and supply routes, and reconnoitering potential battlegrounds as preliminaries to a war with Mexico. Once that war was concluded, the government expanded its scope of inquiry to include, in the 1850's and 1860's, geological and

topographical investigations and identification of possible routes for a transcontinental railroad.

The first government expedition, led by John C. Fremont, was a military reconnaissance which in 1845 moved into the study area in a southwesterly direction to Diamond Valley, and then south along the Toiyabe range through Big Smoky Valley (Goetzmann 1966:250-252; Elliott 1973:44-45). A later expedition was led by Lt. E. G. Beckwith of the 3rd Artillery, who continued John Gunnison's railroad survey along the 38th parallel across the Great Basin to California in 1854 (Welch 1979:5-6; Goetzmann 1966:288). That same year, John Reese, a scout for Col. E. Steptoe, reconnoitered the central Nevada valley which later bore his name.

In 1859, Capt. James Simpson led an expedition through the region that resulted in establishment of a third route through central Nevada. Accompanied by Howard Egan, who had explored the area previously (Welch 1979:6), Simpson located a route from Camp Floyd, Utah, to Genoa, Nevada. Although this route proved unsuitable for a railroad, an expedition participant, Geologist Henry Engelmann, was able to develop "a complete transcontinental profile from the Missouri to the Pacific" (Goetzmann 1966:309). The route was, however, suited to wagon traffic, "such an improved route" that it was quickly adopted by George Chorpenning's mail line, which had been established originally along the Humboldt (Goetzmann 1966 293; Welch 1979:6). Known as the Egan-Simpson or Central route, this road achieved nationwide publicity in 1860, with the inauguration of Russell, Majors and Waddell's Pony Express mail service between San Francisco and Independence. The service was short-lived (April 1860-October 1861), but it demonstrated the importance of the Central route--John Butterfield's Overland Mail and Stage Co. was rerouted along it in March 1861--and became almost instantly part of American folklore (Hafen 1926:165ff; Welch 1979:10).

The stations of the Pony Express and early Overland on the Central route were perhaps the earliest structures associated with the Euro-American presence in Central Nevada. Within the study area there were eight, from Smith Creek on the west to Diamond Spring on the east (USDOI, BLM 1975). The old Pony Express route has been marked by BLM, and archaeological investigation of two stations to the west (in the BLM Carson City District) has resulted in information about the structures themselves and about the lifestyles of the company employees who staffed them (Hardesty 1979). The stations within the study area have not been as closely examined, and there is but limited information about their present condition. As part of the national iconography they

are eminently deserving of further study. The stations are also important in a more local sense, for the Pony Express brought to central Nevada the first of numerous stage and freight stations that by the early 20th century could be found along major (and often minor) roads and trails throughout the region. This aspect of central Nevada history is dealt with below, but it is necessary to establish the Pony Express and early Overland stations as being simply the first manifestations of a long Euro-American effort to develop travel and transportation in a difficult and largely unpopulated environment.

The Native American Experience

Development of the Humboldt and Central routes, although they were at first only narrow paths through a very wide land and were used by travellers simply passing through, had profound implications for the native inhabitants. These were the Paiute and Shoshone, who in family groups hunted small game, gathered seeds and pinyon nuts, and set up camps at many of the springs rising in the foothills or from the valley floors. Prior to white occupation, the Western Shoshone dominated most of the central Nevada region, with southern Paiutes controlling the extreme southern end of the area (Inter-Tribal Council of Nevada 1976c:7). For the Shoshone, the land along the Humboldt near Battle Mountain was a "central area for rabbit drives, antelope drives and festivals" (Inter-Tribal Council of Nevada 1976a:83). The Reese River valley, with its year-round stream, was another focal point of Shoshone life, part of a seasonal cycle of migration that included springtime in Smith Creek valley, and summer in Ione valley and Reese River (Inter-Tribal Council of Nevada 1976a:89-90).

Although attention of whites along the Humboldt and Central routes was directed at first far beyond this area of Nevada, the impact of travelers was immediate and negative. Emigrants en route to California soon depleted game along the Humboldt (Forbes 1969:50). Farther south, the Pony Express and Overland stations, though they were few in number, expropriated for their own use many of the Indians' most important food-gathering sites. The Overland had "a monopoly of the grass . . . to feed their stock, which deprived [the Shoshone] of the seed which they had . . . used as an article of food" (Forbes 1967:80). By 1861, only a few years after George Chorpenning had opened the Central route, Indian resentment over loss of food sources was obvious enough to have drawn attention from the military. Several Pony Express stations were attacked in May 1860, although they were promptly rebuilt and business carried on as before (USDOI, BLM 1975:36ff). Certainly the Indians resented the white presence, and food shortages were very real. In November 1861, G. Wright reported to the Assistant Adjutant General that "were it not for the starving conditions of the Indians, no fears need be entertained about their committing depredations" (Report to the Secretary of War 1889, 20 Nov. 1861, n.p.). The government moved swiftly to arrange treaties with tribes all across northern and central Nevada (Connor to Drum, 27 Oct. 1863, in Report to the Secretary of War, 1889).

Although the government somewhat belatedly established reservations for Northern Paiutes near Pyramid and Walker

Lakes in 1875, Indians in central Nevada were left to fend for themselves until well into the 20th century. Their lands overrun with miners, ranchers and farmers, the Shoshone and Paiute were forced to abandon their traditional hunting-gathering lifeways and rely instead on the white economy (Forbes 1969:61). Fortunate men found employment as farm laborers, herders or cowhands, and women as house servants (Forbes 1969:60, 61; Inter-Tribal Council of Nevada 1976a: 89, 91). Many more, however, gathered at the edges of white population centers, where, according to a census enumerator in 1880, they had "no regular occupation but do everything in the way of wood chopping and chores among families such as washing etc. the government does not support them" (Federal census, 1880, Eureka County). Census takers in 1880 counted significant concentrations of Indians in the Austin area, Grass, Big Smoky and Reese River valleys, and "working for whites" in and around Belmont and Tybo. Although most were simple laborers, ranch hands, or wholly unemployed, Indians in the Eureka area, at least, found work as hunters (Alpha, Pine Station and Mineral Hill, for example). In at least one mining camp, Ellsworth, Indians worked at the "pans, settlers, concentrators and furnaces" of the mill (Angel 1881:523). Regardless of their employment, however, native peoples remained on the fringes of white society: census enumerators seldom bothered to take their names (real or Anglo), and in one case referred to a native community as containing "125 head" (Federal Census, 1880, Nye County).

Not until the 20th century did the federal government make specific provision for native peoples in central Nevada. In 1917, a "colony" was established near Battle Mountain, and under the Indian Reorganization Act of 1934 the government built houses, and later a community center, there (Inter-Tribal Council of Nevada 1976a:84). The Shoshone of Reese River, although invited to move to the Duckwater area in the 1870's, refused. Their tenacity was rewarded in 1934, when the Yomba Reservation was established in upper Reese River, on which the Shoshone have developed cattle herds and grow alfalfa (Inter-Tribal Council of Nevada 1976a:91).

Mining: The Context

Very little is known about early mining activity in the western Great Basin. Native peoples left stone hammers as evidence of their workings in the Wood turquoise mine in the Crescent District of Clark County, and other prehistoric artifacts have been found in the salt mines of southern Nevada. The first organized mining activity of the historic period is credited to Franciscan monks, who worked several gold placer deposits, silver lode mines, and turquoise deposits, also in what is now Clark County, in the late 1700's. Indian converts most likely provided the labor for these efforts, and the deposits were probably located in conjunction with the Spanish establishment of the trail from Santa Fe to Los Angeles. In 1849 the Mormons, as part of their effort to establish the far-flung "State of Deseret," discovered placer gold at the mouth of Gold Canyon, in western Nevada. These marginal placers were worked for nearly a decade, although by non-Mormons for the most part. Mormons were also responsible for early mineral exploration in what is now the Yellow Pine District in Clark County. In 1855 a party of Mormons returning from California on the "Old Spanish Trail" discovered lead deposits which were designated as the Potosi Mine. After several abortive attempts at smelting this ore, the Mormons succeeded in building a crude furnace at Las Vegas, which produced five tons of lead. (Outline of Nevada Mining History, 1964:1, 2).

The 1850's brought heavy traffic through Nevada, as gold seekers, their eyes intent on California, hurried along the Humboldt Route to the placer fields opened in the wake of the Sutter's Mill discovery in 1848. While the Humboldt Valley certainly felt the impact of these travelers, more remote portions of central Nevada remained relatively undisturbed.

In the 1860's, however, Central Nevada was opened to widespread exploration and mining operations were begun in newly discovered districts in many areas of the state.

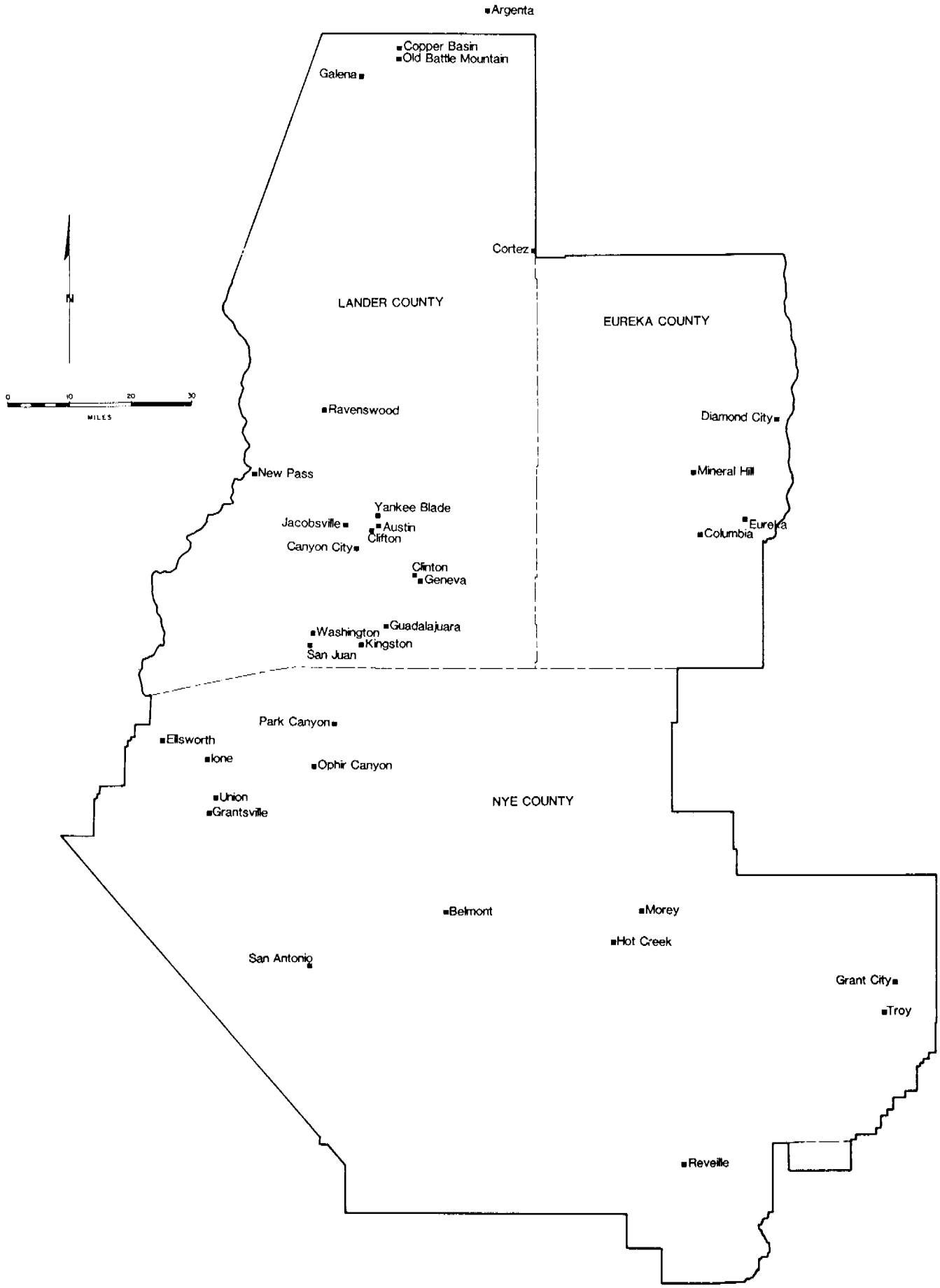
Three important events set the stage for the central Nevada boom. First was the discovery of placer gold at Sutter's Mill, California, in 1848. This event attracted national, and indeed, international attention, and thousands came to the state dreaming of California gold. The second, related, event was the discovery of the mother lode for those mediocre Gold Canyon placers, near the Placerville cut-off of the Humboldt Route. In 1859, Henry Comstock

staked a claim on top of a lode which would bear his name, and which would be so rich that "Comstock" would be synonymous around the world with gold and silver. This discovery, together with the nearly simultaneous discovery of very rich placer gold deposits near Pike's Peak in Colorado turned the eyes of gold seekers toward the area east of California, and during the next decade, these energetic men would explore nearly every mile of the dry, rocky Great Basin, as well as large portions of Colorado (see note 1).

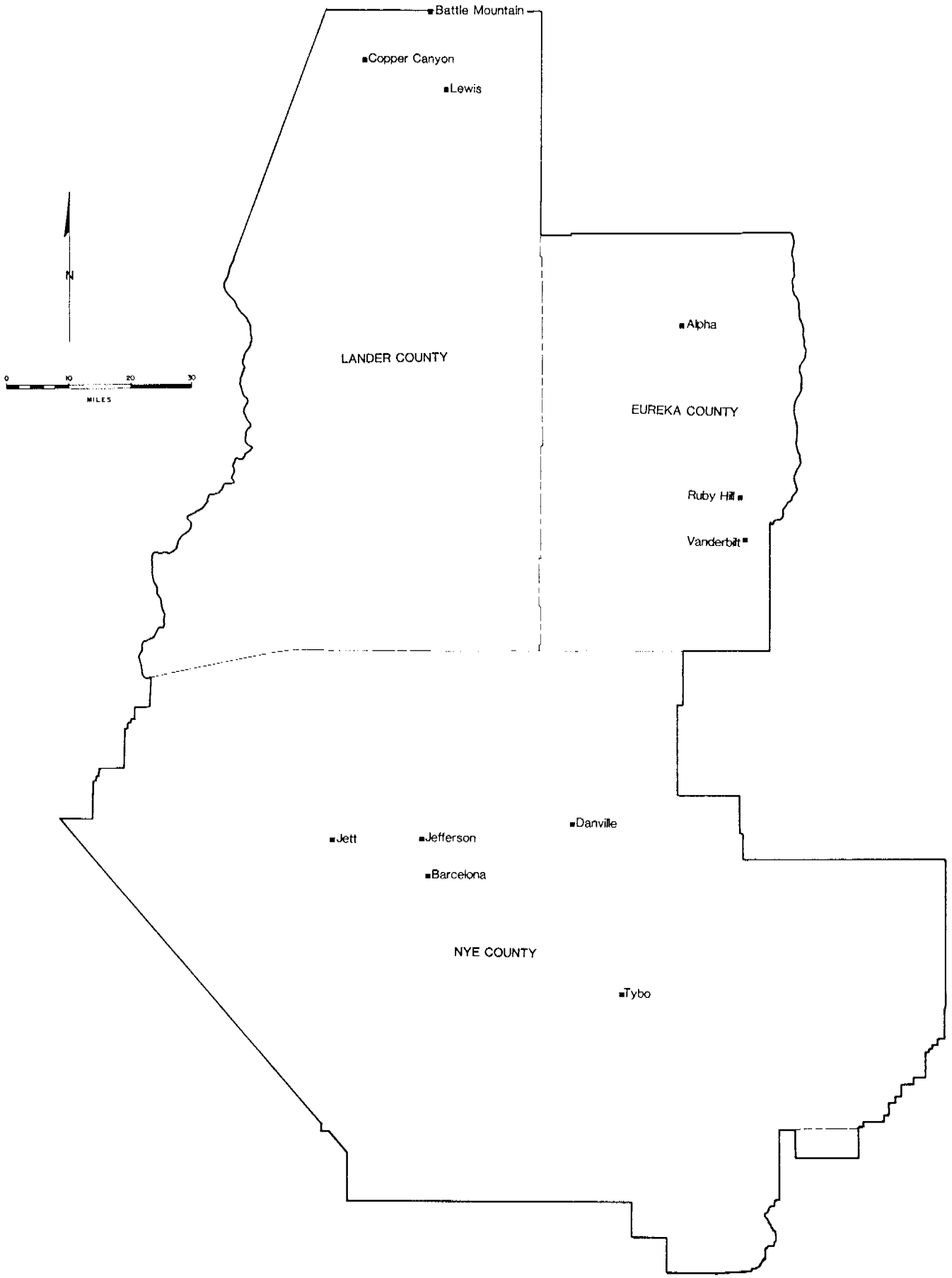
Although the search was rewarding in central Nevada, the precious metals found there were rarely in the then familiar form of placer deposits (nearly pure native gold could be extracted with little more than the help of gravity). While there were a few free gold deposits in central Nevada, most deposits had much more complex mineralization, and the gold was found as sulfates and sulfides, and in conjunction with lead, silver, zinc and other elements. Moreover, these deposits were hardrock, not placer deposits, and were located hundreds of feet under ground in solid beds of rock. These deposits required complex technological solutions to problems of extraction and reduction. Thus the nineteenth century Nevada mining experience was characterized by large amounts of capital investment and organized, cooperative labor.

Nevada's twentieth century mining has taken place largely outside of central Nevada; the discovery of gold and silver in south-central Nevada at the turn of the century set off the state's second period of concentrated discovery and development of precious metals districts. This second boom lasted about fifteen years.

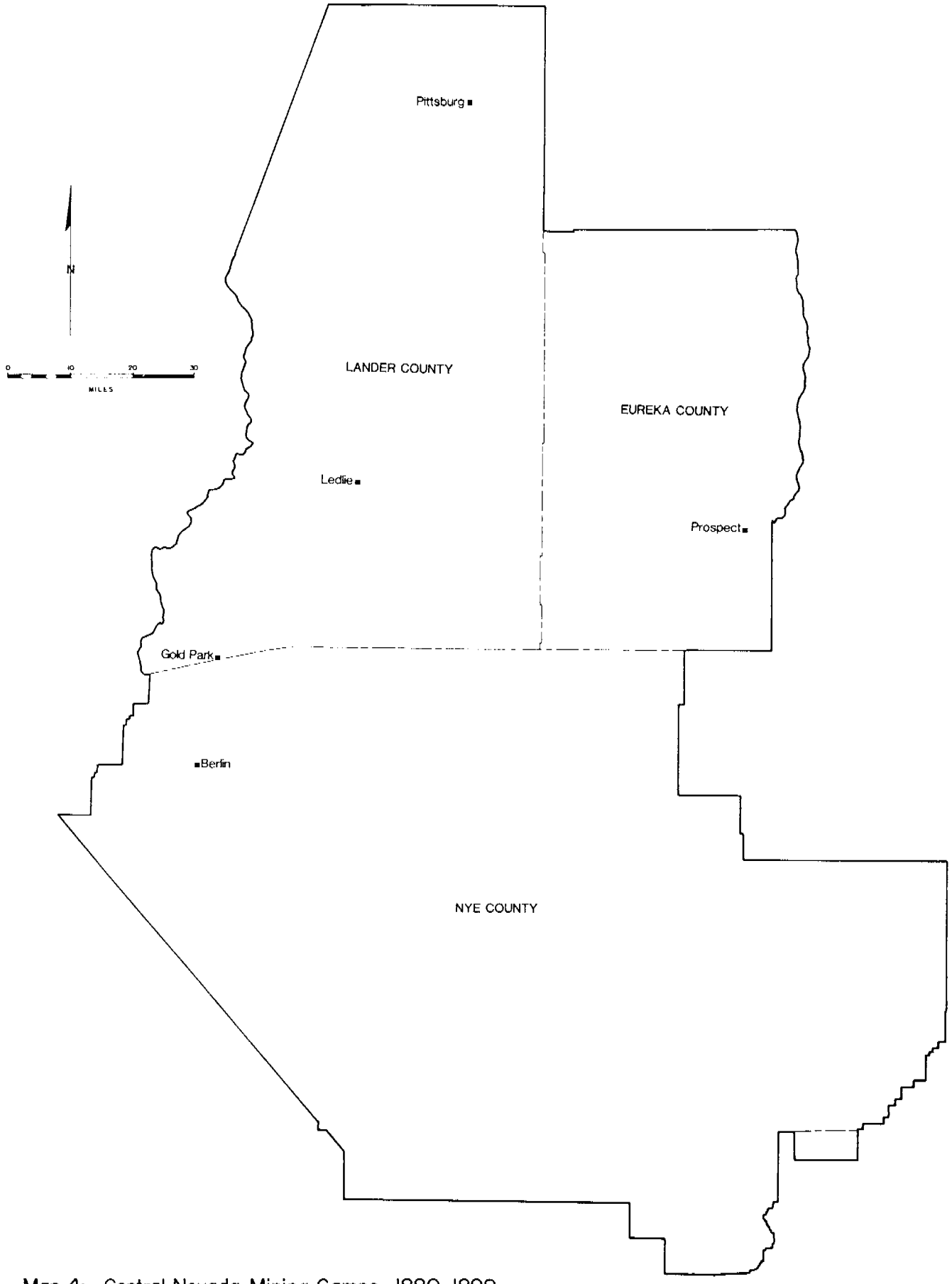
World War I and the technological changes of the early twentieth century brought with them a different American society, dependent on automobiles and electricity, no longer predominantly rural. A wide range of raw materials was required by this society, and its demand for copper could no longer be met entirely by the mines of the upper penninsula of Michigan. The first copper mine to operate on a large scale in Nevada was near Ely; it began operations in 1903-1904. In conjunction with the twentieth century copper boom, a significant amount of methodical minerals exploration occurred all over the state of Nevada. Mostly, these efforts have sought to find profitable base metal deposits associated with the many abandoned silver, lead, and gold districts. Central Nevada mines have also produced some semi-precious turquoise, barite, antimony and other industrial minerals in the twentieth century.



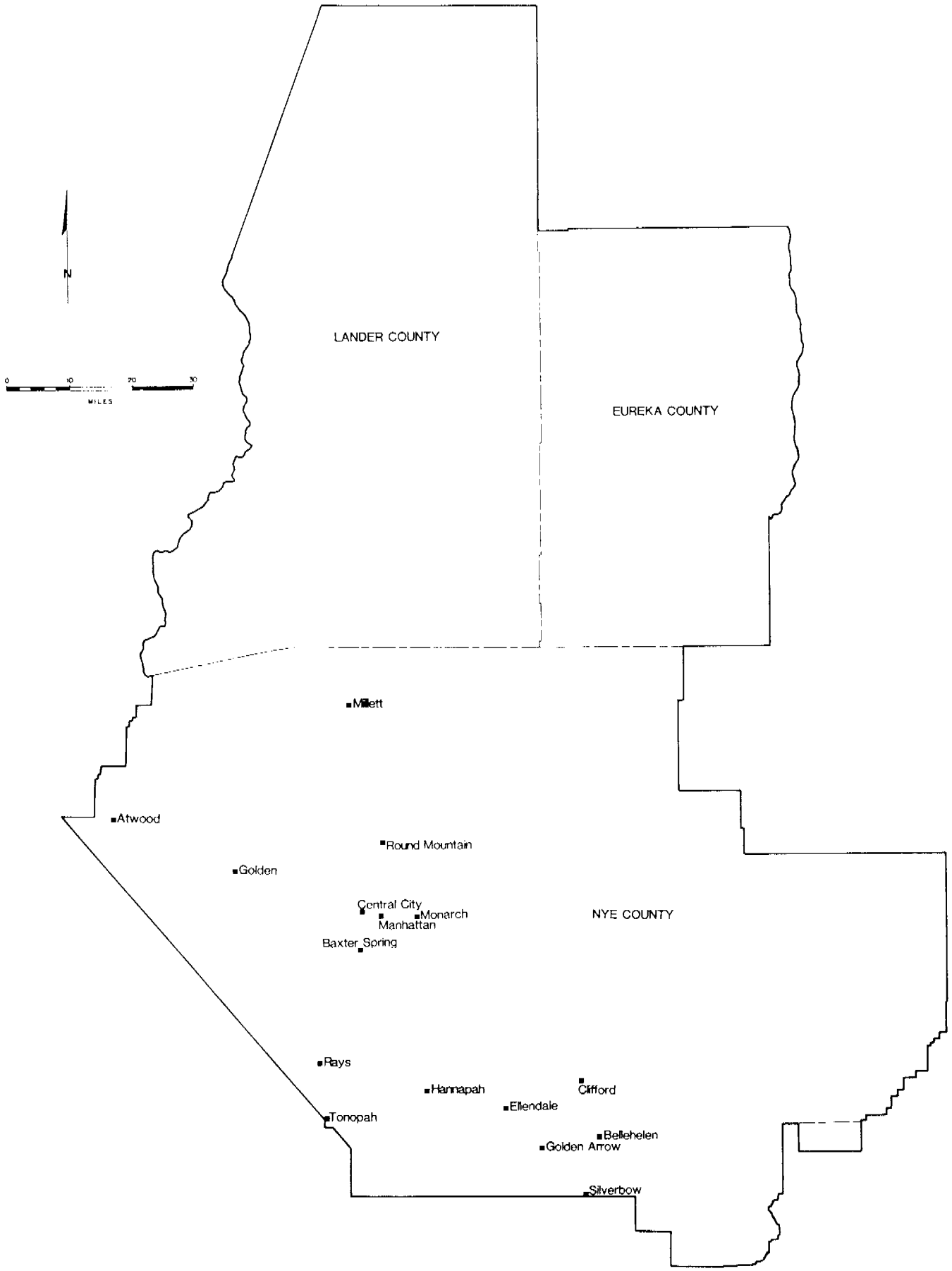
Map 2: Central Nevada Mining Camps, 1862-1869



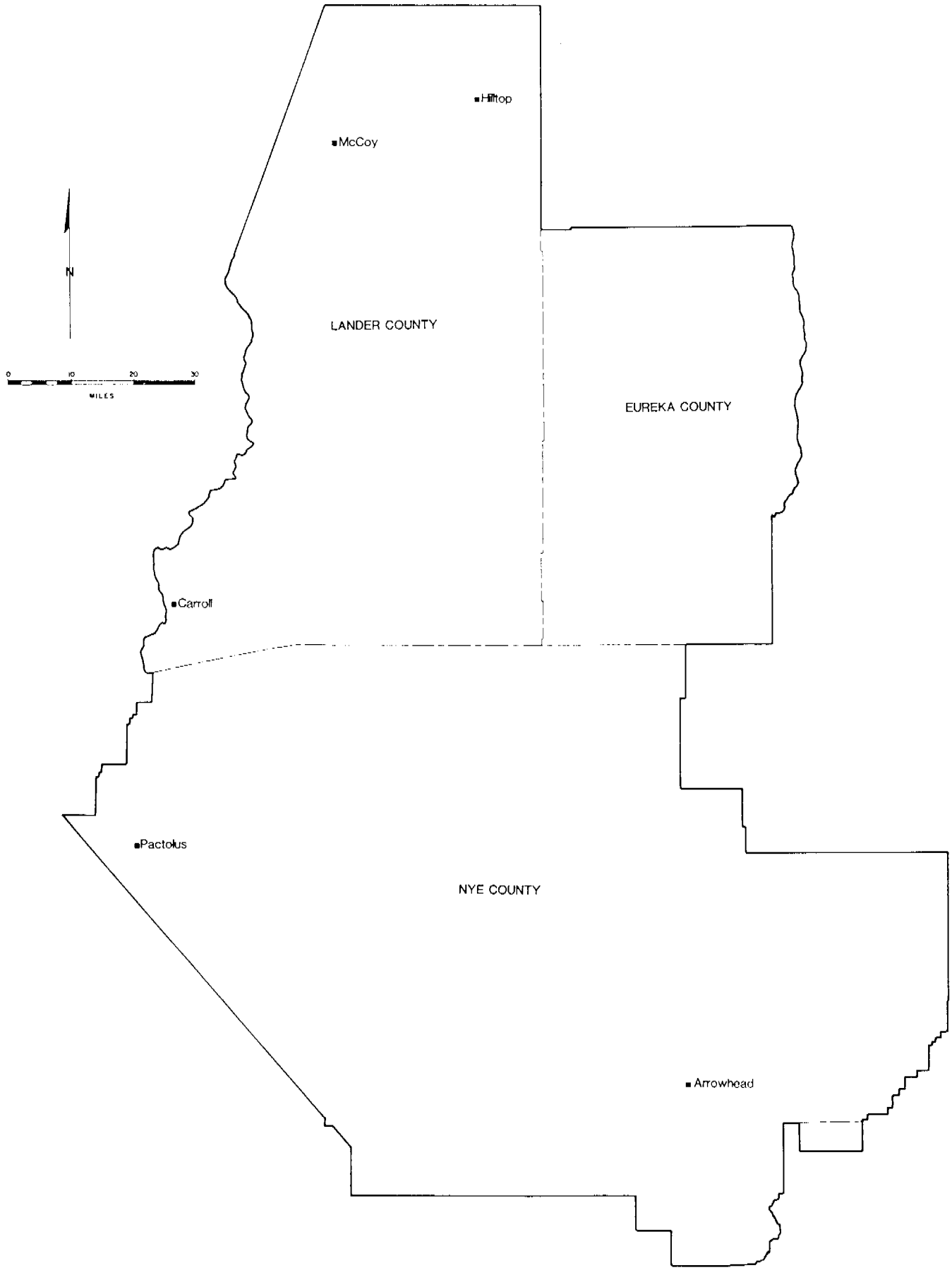
Map 3: Central Nevada Mining Camps, 1870-1879



Map 4: Central Nevada Mining Camps, 1880-1899



Map 5: Central Nevada Mining Camps, 1900-1909



Map 6: Central Nevada Mining Camps, 1910-1920

Mining: The Central Nevada Experience

The first major discovery of precious metals in central Nevada took place in Pony Canyon near the Pony Express/ Overland road. In May 1862 William Talcott made the initial discoveries in what became known as the Reese River District. A rush soon developed, and within six months Lander County was created from parts of Humboldt and Churchill counties, with Jacobsville (soon replaced by Austin) as the seat of government. By 1867 there were 11 mills and more than 3,000 mining claims in the district, despite the fact that the district's ore was not effectively reduced until development of the Reese River roasting process in 1869.

In 1865, the Manhattan Silver Mining Company began a systematic effort to acquire the majority of the properties in the district, beginning with the purchase and rebuilding of the Oregon Milling and Mining Company's mill in Upper Austin. By operating a large and efficient mill, the company hoped to drive other mills out of business. Acquisition of individual mines followed, and by 1877, the Manhattan Co. owned and operated all the principal mines and mills of Reese River.

The Manhattan mill closed in 1887, when the value of the ore mined and milled by the company became insufficient to support the operations. Between 1887 and 1891 the Manhattan Co. went through several reorganizations that ended in the incorporation of the Austin Mining Company. The Austin company immediately set to work on two projects intended to revive the Reese River District. The first was construction of a drainage tunnel (first begun in 1871) from Clifton into Lander Hill. The aim was to drain the major mines of the district and at the same time provide an efficient means of transporting ore to the company's new mill (the second revitalization project) at the tunnel's mouth at Clifton.

These efforts to rejuvenate the district were doomed to failure, however, and neither tunnel nor mill was completed as planned. The first setback occurred in 1893 with the demonetization of silver and the resultant drop in silver prices. The 1896 electoral defeat of William Jennings Bryan, a strong advocate of the free coinage of silver, sealed the fate of silver mining in Austin as well as many other districts in the west. The final blow to the Austin Mining Company came in 1897 when company directors discovered that the firm's superintendent, P. T. Farnsworth, had embezzled more than $300,000 of the company's bullion and had rerouted a great deal of equipment destined for the new Clifton mill to his own operations in Utah. These events fatally crippled the company, and by autumn of 1898 all the mines in the

district were decommissioned and abandoned. Machinery in the Clifton mill was salvaged and the remaining structure dynamited (Welch 1979; Goodwin 1966; Angel 1881).

The Reese River District never measured up to people's hopes for another Comstock. The total production of the district from 1865 to 1940 amounted to less than $19 million, $16 million of this credited to the Manhattan Silver Mining Company. Annual bullion production fluctuated from $500,000 to $1 million between 1865 and 1885, with $1.5 million in 1878 being the highest annual production. From 1886 until 1940, the annual production exceeded $300,000 only twice, in 1886 and in 1889.

Although the Reese River District was a disappointment to the miners and investors, it did prove that central Nevada held precious metals, and thus prompted further exploration of the area. From Austin, mining discoveries quickly spread into upper Reese River Valley and into Big Smoky Valley. In 1862 the camps of Canyon City, Washington, and San Juan were established on the western slope of the Toiyabe Range. On the eastern slope Clinton, Geneva, Guadalajara, Kingston, Bunker Hill, Park Canyon and Ophir Canyon were established in the middle and late 1860's. Prospectors also ranged far beyond this region, covering all of central Nevada in their search for gold and silver. The dozens of districts they opened in the 1860's, some attracting interest for only a few months and some for much longer, might be represented by the following examples.

In northern Lander County the Battle Mountain district included the towns of Copper Basin and Galena. Some of the ore from this area was very rich, so rich that it proved profitable to ship it to Swansea, Wales for smelting (at the time, the Welsh had some of the most advanced smelting technology available) (Lincoln 1923:106-107; Stager 1977:72). The Cortez District, southeast of Battle Mountain, was discovered by prospectors from Austin in 1863. Developed principally through the efforts of Simeon Wenban, Cortez showed a sporadic production record until well into the twentieth century (Lincoln 1923:86; Emmons 1910:108).

In central Nye County, the Belmont district was discovered in 1865, and the Hot Creek district in 1867. Two years after the discovery of the Belmont district, the town of Belmont became Nye county seat. Although most of the mines there were shut down by 1885, Belmont retained its political status until 1905. Hot Creek, later part of the Tybo district, enjoyed a modest prosperity in the mid and late 1870's, its smelters producing large quantities of silver and lead. But as the 20th century approached, the

district's fortunes waned (Angel 1881:519-520, 529; Kral 1951:191; Lincoln 1923:160, 195).

Silver was also discovered in the Reveille Range, in 1866. The Reveille District probably started with great promise, and several mills were built. Eleven years later, however, the major properties were consolidated under the Gila Silver Mining Company and by 1880 the camp was nearly abandoned (Angel 1881:526; Lincoln 1923:179).

In the southeast portion of the study area the Troy district was discovered in 1867. The town of Troy was laid out in 1869 and a British company purchased many of the mines. But the 20-stamp mill and furnaces it built shut down in 1872 (Lincoln 1923:195).

During the 1870's there were fewer new districts discovered, and many of these were located near, and geologically related to, districts developed in the previous decade. In 1874, the Tybo portion of the Hot Creek district was discovered and was largely responsible for the overall prosperity of that region. The Copper Canyon area of the Battle Mountain district also dates from this decade (Kral 1951:191; Stager 1977:72).

Although not initially very promising, the Eureka District proved to be the richest mining district discovered in central Nevada during the 19th century. Several thousand tons of extremely rich ore were mined in the first five years after the district was discovered in 1864. However this ore could not successfully be reduced by milling, and the initial locators lacked the necessary capital or skills to develop alternative reduction methods. Two attempts, in 1866 and 1868 were made to smelt Eureka ores, but these ended in failure. In 1869, Maj. W. W. McCoy built a small furnace and demonstrated for the first time that the rich silver-lead ore of Eureka could be successfully smelted. During the next year several other small smelters were built in the district (Angel 1881:430-431).

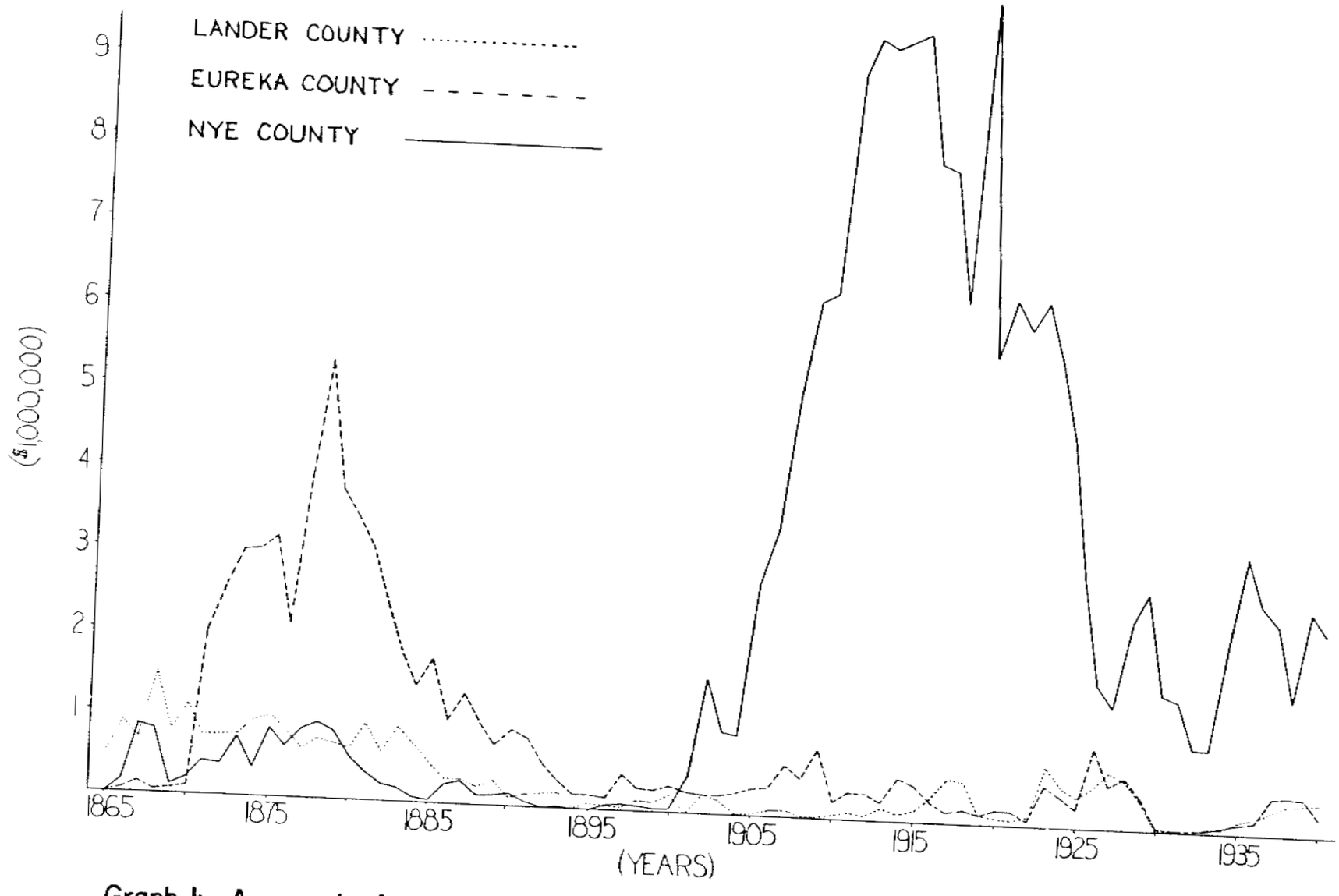
The major impact of McCoy's success was that it convinced outside capitalists that the district was a worthy investment. In 1870 the Eureka Consolidated Mining Co. was incorporated in San Francisco to acquire one group of claims in the district. The following year the Richmond Consolidated Mining Co. (also of San Francisco) acquired another group of claims. Both companies built large smelters and production increased dramatically--from $107,900 in 1869 to $1.4 million in 1870. Eureka's production remained well above the million-dollar mark and reached its height of $5.2 million in 1878. By 1885, however, the major orebodies were exhausted

and problems of water deep in the mines halted any major exploration work for new bodies. Limited mining continued for the next six years under the leasing system, but the district was clearly in decline, the Richmond and Eureka smelters closing in 1890-91. A revival started in 1906 with the merger of the Richmond and Eureka Companies and construction of a new smelter. It was cut short in 1910 when flash floods washed out the railroad between the mines and smelter, and also Eureka's rail link to the north, the Eureka and Palisade Railroad. In the 1930's and 1950's, several companies conducted explorations in an effort to locate new orebodies in the Eureka area, but water still proved a problem and little worthwhile ore was found (Nolen 1962:2-3).

The decade of the 1890's was generally a time of depression for Nevada's mining industry. No major districts were developed during this decade, and many districts discovered during the 1860's and 1870's were running out, or had already run out, of ore that could be profitably mined. In addition, the price of silver began to fall in 1891, and fell dramatically with the demonetization of silver in 1893. This depression can be seen clearly in Graph I (Yearly Production of All Districts in Eureka, Lander and Nye counties, 1865-1940). Nationally, the focus of the precious metals industry shifted to the newly-discovered districts in the Dakotas, Idaho and Colorado during the late 1870's and the two subsequent decades. This shift is suggested by Nevada's population decline between 1880 (59,463) and 1900 (37,119), as many people left the state for more prosperous districts.

Twentieth century mining in Central Nevada opened with Jim Butler's discovery of silver on Mt. Oddie in 1900. Although the Tonopah mining district was rapidly organized, its location nearly 100 miles from any railroad or sizable town hindered development for several years. The many mining investment frauds and swindles of the 19th century also made most outside investors extremely unwilling to invest in an unproven district miles from anywhere (see note 2). As a result, the first year and a half of mining at Tonopah was undertaken by leasing portions of mines to individuals to work. Mine owners received 25% of the net proceeds after the operating costs. In this way risks involved in the search for ore were assumed by the lessee, who provided the operating expenses. It is interesting to note that, previously, the leasing system had been used only in Nevada mining districts that were on the decline.

The operations at Tonopah under the leasing system quite clearly showed that the district warranted outside investment



Graph I: Aggregate Annual Mining Production, 1865-1940: Eureka, Lander and Nye Counties

and the systematic development of the mines that such investment would allow. By mid-1901 a Grass Valley (California) mining promoter, representing several Philadelphia capitalists, arranged to purchase Butler's claims. From these the Tonopah Mining Company was organized. In late 1902 claims adjacent to those of the Tonopah Mining Co. were purchased by another group of Philadelphia investors, and organized as the Tonopah-Belmont Mining Company. These two companies accounted for 60% of the district's total production ($146,336,102) from 1901 through 1940.

The influx of outside investment served to organize the district and increase its production. Between 1901 and 1906, however, transportation of ore to mills in California and central and western Nevada, and of supplies and equipment into the district, presented a serious problem. In 1904 a rail line was completed between Tonopah and the Carson and Colorado Railroad 60 miles to the west in Esmeralda County. But the Tonopah Railroad (later extended south to Goldfield) only served as a partial solution to the district's problems. While it became easier to bring equipment and supplies into the district, the district's total output was limited by the amount of ore that could be shipped out for reduction. In 1906 several mining companies constructed mills to reduce ore locally, thus bypassing the transportation bottleneck (Kral 1951:passim, Lincoln 1923:184-195).

Tonopah was only the first of several districts discovered in Central Nevada in the first decade of this century. In 1902 the Goldfield District, thirty miles south of Tonopah, was organized. Whereas Tonopah was a silver district, Goldfield produced more than $86 million in gold. Within the study area several other districts were discovered, although none proved as rich as Tonopah or Goldfield. The Bellehellen district in central Nye County was discovered in 1905, but no production is credited to that district until 1918, and then only $29,473. Silverbow was discovered 30 miles south of the Bellehelen district in 1904, and shipped its first bullion in 1906. There reportedly was a two-stamp mill in operation there in 1913, and a larger mill was built in 1929. The production of the district was, however, quite sporadic, and "It is believed that the mill operated but a short time" (Kral 1951:162).

In 1906 two districts were identified on the western slopes of the Toquima Range: Round Mountain and Manhattan. Although they had rather sporadic records, both of these districts had periods of five to seven years when their annual production was in excess of $100,000. Round Mountain and Manhattan are noteworthy because they represent the first

time placer mining operations had taken place in the state on any significant scale.

Placer mining is relatively rare in Nevada, because little of the state's gold occurs in the free form necessary for placer deposition. However, there were lode deposits in the Round Mountain and Manhattan districts, as well as in the Battle Mountain, Bullion, and Hilltop districts (all in northern Lander Co.) and in the Union and Twin River districts (Nye Co.) that contained significant quantities of free gold, and stream characteristics were such in these districts that the deposition of placer gold did occur.

In all but the Round Mountain, Manhattan and Battle Mountain districts, these placer deposits were small and their yields probably less than $100,000 each. Round Mountain enjoyed an early period of relatively high production beginning in 1908 and running through 1919 or 1920. During this period several lode mines and numerous placer operations in the district produced between $250,000 and $500,000 a year. In 1908 several hydraulic monitors were in operation, with water obtained from a 9-mile pipeline across Big Smoky Valley from Jett Canyon (Vanderberg 1936:133-145). Manhattan's early production record is somewhat more sporadic, exceeding $200,000 only three times between 1906 and 1930. Round Mountain and Manhattan enjoyed revivals during the 1930's and saw large-scale placer mining. Manhattan's most productive period of placer mining was between 1938 and 1946, during the operation of the Manhattan Gold Dredging Company's floating bucket line dredge. The dredge, which floated in a pond made from water piped 12 miles from Peavine, worked nearly five miles of Manhattan Gulch, creating large mounds of tailings in its wake. During its 8 years of operation in the district, the dredge recovered 133,000 ounces of gold ($4.5 million) (Kral 1951:115).

In 1947 the Manhattan dredge was taken apart and moved to an alluvial fan at the mouth of Copper Canyon in the Battle Mountain district. Placer gold had been discovered in this district in 1909. Because of their depth, most of the placers were at first worked by drifts (tunnels) and shafts, with several still in operation in the 1930's. As in Manhattan, dredging proved the most successful method for recovering placer gold in the district. Between 1948 and 1955 the dredge recovered over 100,000 ounces of gold. Between their discovery and 1968, placer gold recovered in the Round Mountain district amounted to 232,000 ounces; Manhattan, 210,000 oz.; and Battle Mountain, 156,000 oz. (Johnson 1973).

Between 1860 and 1940 mining districts of Eureka, Lander and Nye Counties produced $279,687,785 in silver, gold, lead, zinc, copper, and other metals. Nearly half of this production came from the Tonopah district ($146,336,102). Next highest was the Eureka district ($52,288,024), and Reese River was third ($18,494,209). (Appendix A lists the total production of each individual district within the BLM Battle Mountain District).

Many chroniclers of Nevada history have tried to make some order out of the state's mining history by identifying several periods characterized by the level of production. Using this approach they describe two cycles in the state's mining industry. The first begins in 1849 and ends in 1899. It is further divided into four periods: Discovery (1849-1868), Prosperity (1869-1880), Decline (1881-1891) and Depression (1892-1899). The second cycle begins with the opening of the 20th century and is also divided into periods: Discovery (1900-1907), Prosperity (1908-1918), Decline (1919-1934) and Revival (1935-) (for example see "Outline of Nevada Mining History, 1964:1, 13-24). Because these periods and cycles are based on annual production they are, in effect, a chronicle of the seven largest districts in the state: the Comstock, Reese River, Eureka, and Pioche during the early cycle, and Tonopah, Goldfield and Ely during the later cycle. The production histories of these large districts tend to overshadow those of the many smaller districts. And while production history and the total dollar value of that production are interesting aspects of the state's mining history, characterization of that history or the history of a single mining district solely on this basis can lead to oversimplification of a most complex subject.

Production figures were (and are) important to mining company investors and stockholders, and to city, county, state and federal tax collectors because they represent the final return in a lengthy and complex industrial process. However, these figures shed little, if any, light on the type and scale of human activity that occurred in mining districts, or on remains from that activity. While production figures determined the significance of a district as a producer of metals, it will be the technological, economic and social history of mining and associated activities in the district that should be the central issue in determining the cultural significance of a mining district.

In order to familiarize the reader with the pattern of events occurring over the lifetime of a mining district, the

next section will outline in general terms the history of a "typical" mining district in central Nevada during the late 19th and early 20th centuries. Although not a chronicle of any particular district, it should provide a basic framework within which individual districts can be studied (for short historical summaries of each district within the study area, see Appendix A). The final section of the chapter will discuss the mining technologies used in central Nevada during this period.

Mining: The Pattern of Development

Development of most 19th century mining districts followed essentially the same pattern: discovery; exploitation and possibly abandonment; consolidation and the development of industrialized mining; decline; abandonment (or revival).

Initial discovery was seldom made by professional exploration geologists, but rather by self-trained, or untrained, individuals. As a result, luck played a more important role in the discovery of a district than did any knowledge of mineralogy or orogenesis. Lack of such knowledge was not, however, crucial. These prospectors were seeking precious metals deposits, and the location of such deposits required knowledge of only a limited range of mineral types.

Discovery of a district quickly touched off a rush, with hundreds or sometimes thousands of people hoping to lay claim to a rich piece of ground or to set up lucrative business among the miners. The subsequent development of the district and its camp(s) has been characterized by historians as impermanence, "instability and a high percentage of wasted effort" (Paul 1963:101). Despite great hope and effort, many districts and their associated communities died before they were well-established. Most 19th century precious metals districts in central Nevada simply were not large enough to be very long-lived.

Almost immediately after discovery and organization of a district, some of the original locators sold their claims, either to other people in the district or to promoters and entrepreneurs who arrived toward the end of the rush, and moved on to seek gold and silver elsewhere. The first serious mining operations were primitive; their major purpose was to remove the richest and most easily-obtained high-grade ore.

These first mining operations also provided a glimpse of the extent of the orebodies in the district. While it was rare that any of these first operations went as deep as 100 feet, it was often possible to gain some idea of the possible size and richness of the orebodies at depth. It was at this point--three months to perhaps a year after initial discovery and rush--that the district reached its first critical point. Problems arose that called into question the pace of future development of a district--and possibly its future existence.

Several of the problems were posed by nature: geographical location of the district, weather, nature of the ore, and availability of wood and water. Although few

districts were totally abandoned because of severe weather, the development of many was slowed. Availability of water, for milling and for drinking, and of wood, for heating and bracing for the mines, could present a difficult problem for miners and merchants of the district. As the population of the district grew, the few nearby springs or streams rapidly became inadequate sources of potable water. Often the mines were wet enough to provide water for milling, but such water was seldom suitable for human consumption. If the mines were very wet, the miners had the expense and bother of trying to keep them pumped out.

Lack of wood began to create problems for the residents of a district as soon as easily harvested timber in the immediate proximity had been cut. If the ground proved unstable at depth, the miners too began to have problems. Without wood they could not mine because they could not support the sides and roofs of their workings.

By far the most serious difficulties, however, could lie with the ore itself. If initial work in the district showed that the ore was too poor to justify working it, that there was not a great deal of it, or that there were metallurgical problems with processing it, the district's viability was threatened. In the first case the district was abandoned, perhaps to enjoy a revival when the price of the metals found in the district rose, and/or when milling technology made working the ores of the district economically feasible. A district which seemed to contain only small amounts of ore was not necessarily abandoned forthwith: there were generally a few people willing to operate a small mine in the hope that more ore would be found.

Metallurgical problems were usually solved sooner or later. Mining and milling on the Comstock had solved the problem of reducing ore containing free gold and silver as well as sulfides and sulfates. In central Nevada two of the largest districts discovered presented distinctly different metallurgies: Reese River ores were contaminated with arsenic and antimony, and Eureka's were in some cases more than half lead. In both cases the richness of the ores provided the incentive to develop necessary reduction techniques. Until the University of Nevada developed the cyanide milling process in 1896, these three reduction processes (Washoe pan amalgamation, Reese River roasting and amalgamation, and Eureka smelting) were used throughout the mining west with only minor modifications, often making it possible to work the ores of a district previously abandoned.

Before many long-lasting solutions to problems of transportation and supply were developed, the basic decision

of whether the district was worth further investment had to be answered by many individuals: merchants, investors, miners, freighters. All these people made their decisions more on faith and hope than on any hard facts regarding future prospects. However, if the collective decision was that the district was viable, the residents and others associated with the district developed a general enthusiasm, a "team spirit," about their district. In part this spirit was founded in the desire to be part of another Comstock; but it also reflected both a desire to put down a few roots and the gambler's faith in what seemed to be a winning hand.

The district having survived its first test--a crisis of confidence as much as a test of possibilities--outside individuals and companies began to purchase claims and invest in larger-scale development. The result was the establishment of far more industrialized mining than had previously been the case. It was characterized by well-ordered, highly structured organization and the existence of owners and financial backers perhaps thousands of miles from the operations.

Industrialization affected the mining society as well. One principal characteristic of any industrialized society--local, regional or national--is an elaborate division of labor between one group of wage earners and shift workers, and another group consisting of managers, technicians and financiers. As industrialized mining moved into central Nevada, the man working at the mine face was no longer able to share in the risks and profits of the mine. Instead, he received a wage based on the time worked, while others took the risks of operating the mine, made the decisions, and hoped to share the wealth. Urbanization accompanied the rise of industrialized mining as miners brought families to the camps, hoping to establish a stable life. The same confidence that brought outside investment also encouraged merchants to build substantial and permanent business houses.

Industrialized mining also meant construction of large-scale reduction facilities in close proximity to the mines. Having mills close by the mines obviated the serious and expensive problem of transporting ore outside the district for reduction. It also allowed mines to operate on a scale limited only by the capacity of the mills, rather than the limits of a transportation system.

Construction of mills within the district relieved one source of pressure on the transportation systems serving the area, but those systems could be severely tested by the industrialization and urbanization of the district. Although the material requirements of small and/or short-lived

districts were never so great that transportation difficulties could not be solved by more teamsters and freighters entering the market, such was not the case for the three largest, Reese River, Eureka and Tonopah. In all three districts, there was a tremendous need for inexpensive transportation of large quantities of timber and wood, machinery of all descriptions, and countless consumer goods. Mine owners correctly realized that construction of a railroad would lower transportation costs by 60-75%; local businessmen and civic leaders considered a railroad a matter of civic pride. Both groups realized that lower freight costs resulting from railroad construction could bring greater profits and longevity to the district. Thus Eureka obtained a railroad in 1875; Austin in 1880; Tonopah in 1904.

The Eureka and Palisade Railroad was originally chartered to haul ore to proposed smelters at Palisade. The construction of numerous smelters in the Eureka District, particularly those of the Richmond and Eureka Consolidated companies, removed this part of the railroad's business. However, the railroad earned a considerable amount of revenue hauling freight into Eureka and taking bullion and lead ingots out. Indeed, in 1880 the railroad reported a profit of $248,323 on hauling 40,000 tons of freight to and from Eureka. That the mines and smelters were important customers is apparent from the fact that during 1880 the Eureka and Palisade hauled 6,000 tons of coal and 8,600 tons of lumber into the district: nearly 2/3 of the total freight. The railroad's long-term fortunes were thus intimately tied to those of the district; both began their declines in 1885.

The Nevada Central Railroad, from Austin to Battle Mountain, was not completed until production in the Reese River district began to fail. At the time of its construction many felt that Austin could not adequately support the line. The Nevada Central may have slowed Austin's decline somewhat, due to the inexpensive transportation it afforded, but in and of itself the line was unable to maintain the town's prosperity.

If there were any lessons to be learned from the experiences of the Nevada Central and the Eureka-Palisade, the major one was that to be successful a railroad had to be built during the early years of a district's life. The owners of the Tonopah Mining Co. fully realized this, and saw too that prompt linkage with existing rail transportation would facilitate rapid development of the district. Tonopah's development was indeed swift, and the inexpensive transportation afforded by its railroad was undoubtedly central to this success.

The rise of industrialized mining in a district did not necessarily mean that the district was profitable or that it would last a long time. There were countless districts, begun with high hopes, that grew quickly and then collapsed (see Note 3). Often however, industrialized mining meant that activity in a district might be prolonged. Industrialization, with its large investment and elaborate systems of operation and organization, produced a momentum that could carry the district well beyond the logical point of abandonment. Austin is one example of this effect, albeit undocumented. The only thoroughly documented example of this phenomenon is White Pine District in eastern Nevada. White Pine enjoyed a spectacular boom in the late 1860's but produced less than $10 million in its early years. However, the district held on for nearly 15 years, with heavy investments from British syndicates. Eureka and Tonopah probably experienced the same slow decline prolonged by renewed exploration and development work, though the documentation is less complete for these districts.

The peak of production in a district generally coincided with the industrial phase of development, due in part simply to the scale of operations. However, large scale mining operations also hastened the exhaustion of the known orebodies. The decline was marked first by shrinking bullion output, and then by closing of the mines and mills and an exodus of people from the district. In larger districts, the decline could be long and slow, marked by work force reductions and the closing of smaller, less efficient mills. The decline could also be slowed by continued or heightened exploration and development work. Often another wave of consolidation occurred, as a way of more efficiently working the mines. If a revival did not take place, a district's last gasp could be the resumption, or introduction, of the leasing system to work the mines.

Abandonment of a district brought with it a certain amount of dismantling and salvaging. Mine and mill equipment (hoist engines, pumps, stamp batteries, concentrating tables) was often removed and sold for scrap or moved to other districts. Merchants and proprietors packed up their goods, and sometimes their buildings. What was left behind can still tell stories--the mine and mill sites tell of the efforts men were willing to make to wrest gold and silver from the earth; the town and camp sites still tell of the lives of those who worked the mines.

Mining: The Technology

Mining technology in the latter half of the 19th century and the first part of the 20th century is represented by a varied and seemingly chaotic collection of equipment and structures that lie scattered throughout the west, abandoned, unused and uncared for. Often these remains baffle those who must deal with these resources. One danger to such resources is the failure of government and the public to understand them, or to consider them as evidence of a system of interrelated activities. Failure to understand the basic characteristics of this system, particularly when related sites are separated from one another by miles, can lead to resource planning that misconstrues the resource, or at worst, to a poorly-conceived mitigation plan.

Lode, or hardrock, mining, historically the most common type of mining in central Nevada, consisted of four activities: 1) exploration and development; 2) excavation and removal; 3) transportation; and 4) reduction. As we have already pointed out, the process of searching for an ore deposit was haphazard at best, especially in the 19th century. Once a promising outcrop had been discovered, and a claim staked, one or more adits or shafts were dug in an effort to determine the size, extent, and richness of the deposit at depth. Claims staked in areas adjacent to a promising outcrop needed to be explored in a similar fashion. In the early days of a district much of this exploration work was carried out by hand: rock was broken by picks and sledges and hauled away in wheel barrows or buckets. A mine's first shaft, probably dug by its discoverers, consisted of a hole in the ground with little or no bracing. Access up and down the shaft was by ladder; ore and waste rock were hoisted out by a windlass. As the shaft was sunk deeper, bracing was added as required and the windlass was replaced by a whim: a large drum, turned by a mule or horse, around which the hoisting cable was wound. Use of blasting powder, and later dynamite, significantly improved the rate at which tunnels and shafts could be driven. However, until the widespread introduction of compressed air drills in the late 1880's and early 1890's, holes for the explosives had to be laboriously drilled with star drills and sledges.

As the search for ore extended further out from the shaft or main tunnel and as the workings got deeper, it often became necessary to make improvements to the mine so that the exploration and mining of ore could proceed smoothly. This development work could consist of nearly anything: widening or straightening of tunnels for more efficient waste and ore hauling, retimbering temporary exploration tunnels, sinking a new and bigger shaft, or installing pumps.

The techniques of mining and removing ore differed little from those of driving an exploration tunnel in barren rock. Ore or waste rock was broken up by blasting, loaded by hand into cars, and taken out of the mine either up the vent shaft or out the main tunnel. Removal of ore involved a great deal of skill, because the goal was to remove as much of the ore as possible without the roof caving in. In narrow vein deposits, particularly those with steep inclines, virtually all the ore could be removed and the walls braced with wood posts. With larger orebodies or veins in unstable ground, sophisticated systems of timber bracing were adopted to prevent cave-ins. The most common system, still used today, is called square-setting. Square-sets consist of a series of interlocking open-sided cubes constructed of massive timbers 10-15" square and 8-12' long. Often old stopes (the "holes" from which ore was removed) were also filled with waste rock as a means of preventing cave-ins that could disrupt the operations elsewhere underground. (Filling old stopes with waste rock was also more efficient than hauling the rock to the surface.)

The larger the mine became the more complex and organized it was. Miners could be at work on several orebodies at once, each miner breaking approximately one ton of ore per day. Once broken, ore was loaded into cars and taken to the main shaft or tunnel and out of the mine. Waste rock was removed in the same manner. At the same time timber, blasting materials and other supplies were being brought into the mine for use. Much of the activity of a mine revolved around the shifts. Blasting, for example, was done between shifts when few if any men would be in the mine. Waste rock and ore were taken to the surface at different periods during a shift, or by different routes, in order to simplify materials handling at the surface. For every man working underground, most mines had a least one man on the surface.

As the mine grew deeper the problems of temperature, water and ventilation increased. Pumping was the most common solution to the problem of water. The type of pump used depended on the depth of the mine. Often a piston pump at the bottom of a shaft or a series of pumps at various points down a shaft were used, powered by a steam engine (a Cornish pump) at the surface. Hydraulic pumps were also used if a sufficient supply of water with a good head could be found. Pumping of any kind was expensive however, and mine operators often tried to drive tunnels under the workings of their mines and let the water drain through these tunnels. In Austin a number of tunnels were dug during the first five years, and an 1882 map of Eureka shows seven drainage tunnels. While tunnels were a possibly cheaper and

technologically simpler solution to draining mine workings, and were commonly employed in new districts, they seldom met their builders' expectations once the mines of a district reached depths of more than 500 to 1000 feet.

The Union Pacific Tunnel Company, for example, was incorporated in March, 1871 to construct an exploration and drainage tunnel into Lander Hill in the Reese River district. Work on the tunnel ceased after 300 feet due to lack of funds, and the company was subsequently purchased by the Manhattan Company. This tunnel was never finished because it was felt that there was not enough water in the mines to justify such a long tunnel, especially when the majority of the workings would have been below the level of the tunnel. Interestingly, resumption of work in this tunnel in 1891 was seen as the key to reviving the mines of the Austin area.

In most mines, those that were not very deep, problems of ventilation were solved when a second air shaft or tunnel was connected with the workings and the mine developed its own drafts. Often these drafts considerably improved the hot and humid conditions underground. If they did not, ice water and blocks of ice, as well as blowers, were used to cool and ventilate the workings.

Surface remains associated with an underground mine will vary considerably depending on the age of the mine, size, and extent to which the site has been vandalized and scavenged. The most visible and permanent feature will be the tailings piles surrounding the tunnel(s) and shafts(s) of the mine. These piles consist of waste rock that has been removed in the process of driving tunnels underground to search for ore, and in the process of excavating and removing that ore. Often the size of the tailings piles can serve as a rough indication of the extent of the underground workings--with the caution that often the more profitable mines used waste rock to fill in mined-out stopes.

The geology of the orebody(s) will to some extent determine the location of the major mine entrances. They will be arranged to minimize the effort required to reach the ore and to remove the ore and waste rock. For many mines the main entrances changed as the search for ore went deeper underground. The workings of mines on ridges or hillsides most often were reached by near-horizontal tunnels. As the workings grew deeper the position of the main tunnel moved further down the hillside so that it always remained close to the level of the major workings. When it was no longer feasible and practical to drive tunnels to reach the workings, one or more vent shafts would be constructed. Those mines that could not, because of the local topography, use tunnels

to reach their workings, resorted to shafts. The position of these shafts often changed also to minimize the distance ore had to be hauled to a shaft.

By this stage in the development of a mine, the first structure on the surface had been erected: a powder house, essential to protect the explosives used underground from the weather. This structure could be as simple as a stone-lined dugout, or as elaborate as a dressed stone building with an iron door. Because there was always a chance that the powder (later dynamite) would explode accidentally, the powder house was usually some distance from other surface activities.

If exploration and exploitation showed that the mine had promise, one of the first substantial structures to be constructed, if required, was a small headframe and a hoist house with a small, steam-powered hoist. In districts where the weather was bad, these two structures were often enclosed as a single building, as much to protect the equipment as the miners. The earliest headframes, of the 1860's and 1870's, were built of wood. By the mid-1880's the technology existed to build cast- and wrought-iron or steel and wrought iron headframes. As mining remains around Tonopah testify, steel was the dominant material for headframes by 1900. However, it is unlikely that many metal headframes exist today due to the scrap drives of World War II. By 1900 corrugated steel over wood or metal frames had replaced wood and stone as the dominant building material for nearly all surface structures at a mine site.

Until well into the 20th century steam was the favored motive power for hoisting works because of the low speed torque advantages of reciprocating steam engines. Gasoline or diesel engines became popular in this century for small operations and electric motors gradually replaced steam for large hoisting works.

If the mine was wet, one or more pumps could be found near the opening of a shaft. The most common type of pump during the 19th century was the Cornish beam engine. This pump, driven by a steam engine, consisted of a large walking beam pivoted at the center. One end of the beam was connected, via a crank, to a flywheel, while the other end was connected to a pump rod or beam that went down the shaft. As the flywheel rotated, the walking beam rocked back and forth, moving the pump rod up and down. At various points down the shaft reciprocating pumps were connected to the rod. In this century, turbine pumps, driven by gas, diesel or electric motors gained favor because of lower maintenance requirements and higher capacities.

Introduction of compressed air drills and other compressed air machinery in the 1880's and 1890's required air compressors at the surface. Compressors were many times housed along with dynamos for electric lights in a power house.

A number of other support activities for underground operations occurred near the main entrance (shaft or tunnel) of a mine, often in one or more separate buildings. The two most important were the blacksmith and machine shops and the carpentry shop. The blacksmith and machine shops' major functions included sharpening of the drills, repair of orecars, and fabrication of track components for the orecar railways both underground and on the surface. Men who worked in the carpentry shop also built and repaired the surface buildings.

At larger mines there might be a separate mine office where the superintendant and staff worked and where the records of the mine were kept. Many mines also had change houses--buildings where miners changed clothes before and after a shift. Occasionally, particularly at isolated mines, there would be a bunk house/boarding house for the men who worked at the mine. Invariably present were storage areas for timber and wood for the mine and fuel for the boilers, as well as track and other spare parts.

In mines where water was a problem, one or more drainage tunnels were associated with the underground workings, but at some distance from the major entrance. If ventilation and heat underground was a problem there also could be one or more ventilation shafts or tunnels at remote parts of the claim, possibly with blowers driven by steam, gas or diesel engines or electric motors.

Waste rock and ore were removed from underground mines in one of two ways. When the access to a mine was via a tunnel, all material going in and coming out did so on small cars that ran on rails. Where access was via a shaft, material in the early years often came out on cars. In many larger mines one or more shaft compartments were dedicated to ore and waste rock skips. These skips would be filled with ore or waste underground, hoisted to the surface, and dumped into bins connected to the headframe.

Once the waste rock reached the surface (in skips or in cars) it was taken to the nearest tailings pile and dumped. The ore's route to the mill depended upon the distance to the mill. If the mill was close by, ore could be transported in ore cars, perhaps the same cars which brought it out of

the mine. If the mill were further away, ore could be transported by aerial tram, on wagons or by railway. The Ruby Hill Railroad in Eureka and the Tonopah-Goldfield Railroad both hauled ore between mine and mill.

Within central Nevada five basic types of reduction methods were used at different times. The Washoe and cyanide processes began with crushing the ore as finely as possible, for which huge batteries of stamp mills were used until well into the 20th century. In the Washoe process, ore dust mixed with water was then fed into large pans or vats equipped with mullers (mixing blades). Into the pan were added mercury, salt, iron filings and a variety of other "notions" and the mixing blades started. After a period of time the water was drained from pans and discarded. The gold-silver-mercury amalgam was sent to a retorting room where it was heated to separate the mercury from the precious metal. The mercury was recovered and used again while the gold and silver was cast as bullion bricks.

The Washoe pan process was a mechanized version of the patio process used in Central American silver mines. In the patio process silver ore, salt and mercury were spread on the ground--normally on a stone-surfaced patio or courtyard--and oxen were led around the mixture, their hooves crushing and mixing the ore. The amalgam was recovered and retorted. A version of the patio process, the arrastra, substituted a circular pit containing ore, salt and mercury for the patio floor. Then large rocks were dragged around the pit by animals walking <u>outside</u> the pit, to accomplish the crushing and mixing.

In a cyanide mill crushed ore was mixed with water and placed in large wood or concrete tanks. These tanks contained a solution of potassium or sodium cyanide, which chemically removed gold and silver from the crushed ore. After the cyanide tank had been agitated long enough to ensure that all the precious metals had been captured, the liquid was drawn off the tank and saved while the slimes were discarded. The cyanide solution was then treated so that the precious metals would precipitate out and could then be recovered and refined. Often, in an effort to increase the efficiency of the reduction process, mills would utilize the Washoe process and follow it with the cyanide process.

The Reese River process also began with crushing the ore. Pulverized ore was then mixed with salt and roasted in large furnaces. Once the ore cooled, it was treated by the Washoe pan process. Because of their high lead content, ores of the Eureka district and other districts with similar

mineralogy could not be practically reduced using amalgamation or the Reese River or cyanide processes, because of the immense amounts of mercury required. In the nineteenth century the only alternative was smelting, relying on different melting points and specific gravities to separate waste rock (slag) from the lead, silver, zinc and gold in the furnaces of a smelter. Introduction of flotation concentration in the 20th century provided a more viable alternative to smelting lead silver zinc ores, and several districts enjoyed revivals based on this technology.

Flotation mills are relatively simple in principle. Ore was crushed to a fine powder in ball or rod mills (these replaced stamp mills in the early 20th century). Crushed ore was then mixed with water and other compounds and fed into flotation cells. Compressed air was bubbled through the cells, bringing the lead and zinc minerals to the surface where they were skimmed off, dried and sent to a smelter. Where significant amounts of silver were also present in the ore, slimes from the flotation cells were sent through a cyanide tank to recover the silver.

The location of mills depended to some extent on the reduction method used. Those mills using the Washoe pan process, Reese River process, cyanide process or flotation concentration required large quantities of water. Mills employing these methods were very often located near rivers, these being the most convenient water source. In cases where the mines were extremely wet, mills were located to take advantage of water pumped from the workings. As a last resort mill operators could pipe water in from collection dams on streams or from well fields, but the expense of acquiring water this way was always balanced against the expense of transporting the ore. Whenever possible, any type of mill would be located on a hillside to use gravity to move crushed ore through the various stages of milling.

For all of the so-called "wet process" mills, ore began its journey at the top of the mill where it was received from the mine and put into an ore bin. From the ore bin, it was fed to the stamp batteries (later ball or rod mills) and crushed. The crushed ore was then roasted (Reese River process) if necessary, before being sent to either Washoe pans, cyanide tanks, or flotation cells. The slimes from any of these processes were then discarded in large tailings ponds while the mercury amalgam, the cyanide solution or the floated concentrates were further refined.

The material flow through the smelters of Eureka and elsewhere in Central Nevada was relatively simple. Ore was received from the mine and large pieces broken for easier

handling. Then it was loaded into the furnaces for smelting. The furnace was tapped at various points, and the slag drawn off and discarded in slag piles. The lead/zinc and silver were drawn off and cast in ingots.

In a few districts in central Nevada, notably Round Mountain, Manhattan and Battle Mountain, placer mining was carried out on a large scale. The basic operation in placer mining was the recovery of free gold from river and stream gravels. The most common recovery method was washing the gold-bearing gravels and allowing the heavier gold to settle out, while the rest of the gravel and sand was washed away. Numerous dry washing techniques could also be used. Placer deposits are formed when running water erodes the rock surrounding a vein of native gold (the lode). Flecks and pebbles of the gold are loosened by the water, and are carried along by the current. These relatively heavy bits of gold settle out of the water whenever the current slows. Eventually, the gold is deposited along with the stream's other dropped rock debris, in gravel beds along the stream channel. Most central Nevada gold was in the form of sulfides or other complex minerals; erosion of these does not produce placer deposits because the gold minerals are not particularly heavy. Placer gold is found in a number of situations. It may be found in old terraces left on the sides of a water course by subsequent erosion, in buried placers overlain by barren gravels in an alluvial fan, or in the gravels of existing water courses.

Elevated river terrace placers occur in both the Round Mountain and Battle Mountain districts. The most common method of working these deposits was hydraulicking, using a high-pressure stream of water to wash gravels into a sluice box to catch the gold. In some parts of both districts the amount of barren gravel was too great when compared with the paying gravel. In these cases paying gravel was mined by driving tunnels and shafts into the surrounding gravel. Gravel was removed from these drift placer mines and washed in the same way that any other placers were worked. The advantage of drift placer mines was the ability to work only in the richest portions of the placer deposit.

In the Manhattan and Battle Mountain districts, some alluvial placers were worked by dredging, which involved floating a dredge in a pond.

> A gold dredge consists of a floating hull with a super-structure, a digging ladder, endless chain of digging buckets, screening apparatus, gold-saving devices, pumps and a stacker. It could be described as a floating mill

> with the addition of apparatus for excavating and elevating the ore [gravels] (quoted in Spence 1980: 401).

The Round Mountain alluvial placers were too deeply buried to be worked by floating dredge. Instead, during the thirty years following the 1930's a number of operations worked the district's alluvial placers by removing barren gravels with heavy earth-moving equipment and then washing the paying gravels in the traditional manner.

It is difficult to discuss in any detail what is likely to remain today of the numerous hardrock and placer operations in central Nevada. It is well known that a good deal of salvaging occurred when an operation was closed down, and World War II scrap drives probably took their toll. In the last twenty years increased public use of federal and private lands in the state have brought pot hunters and vandals as well. Given these factors--and others--it is hard to say what fragments of the mining past are likely to have survived within the boundaries of the Battle Mountain District. Over the past few years BLM personnel have visited a number of mining sites in the district and have completed inventory forms for the sites. Unfortunately, due to the inadequacies of the site form used and the Bureau personnel's lack of familiarity with mining technology it is impossible to tell in any detail what remained at the sites visited.

With these caveats in mind, it is possible to make some general comments about resources likely to have survived somewhere within the boundaries of the Battle Mountain District. Tailings piles around hardrock mines, tailings ponds and slag heaps near mill sites, and dredge tailings and pits on the alluvial fans will have survived because there is no value in them. Often equipment at a mine or mill was salvaged when it closed, or during scrap drives, leaving only concrete or stone foundations. In some cases wooden headframes and trestles to tailings piles will remain, as might the wood or metal buildings that housed the many support functions at a mine site. Vandalism will have taken a heavy toll however. In many cases smelter ruins can be identified by their tall stone or brick chimneys as well as the slag piles. In addition to tailings piles, remains of wet processes might consist of stone or concrete foundations, wood or concrete tanks (cyanide process), ore bins, as well as partial or complete remains of the mill building.

In examining any mining site, it is important to see the resources present as evidence of the four interrelated activities necessary for mining:

Development
Excavation and Removal
Transportation
Reduction

Each site can be analyzed in terms of the technology brought to bear on the problems encountered in carrying out these four fundamental activities.

NOTES

General Note:

All unfootnoted production statistics are from Couch and Carpenter (1943).

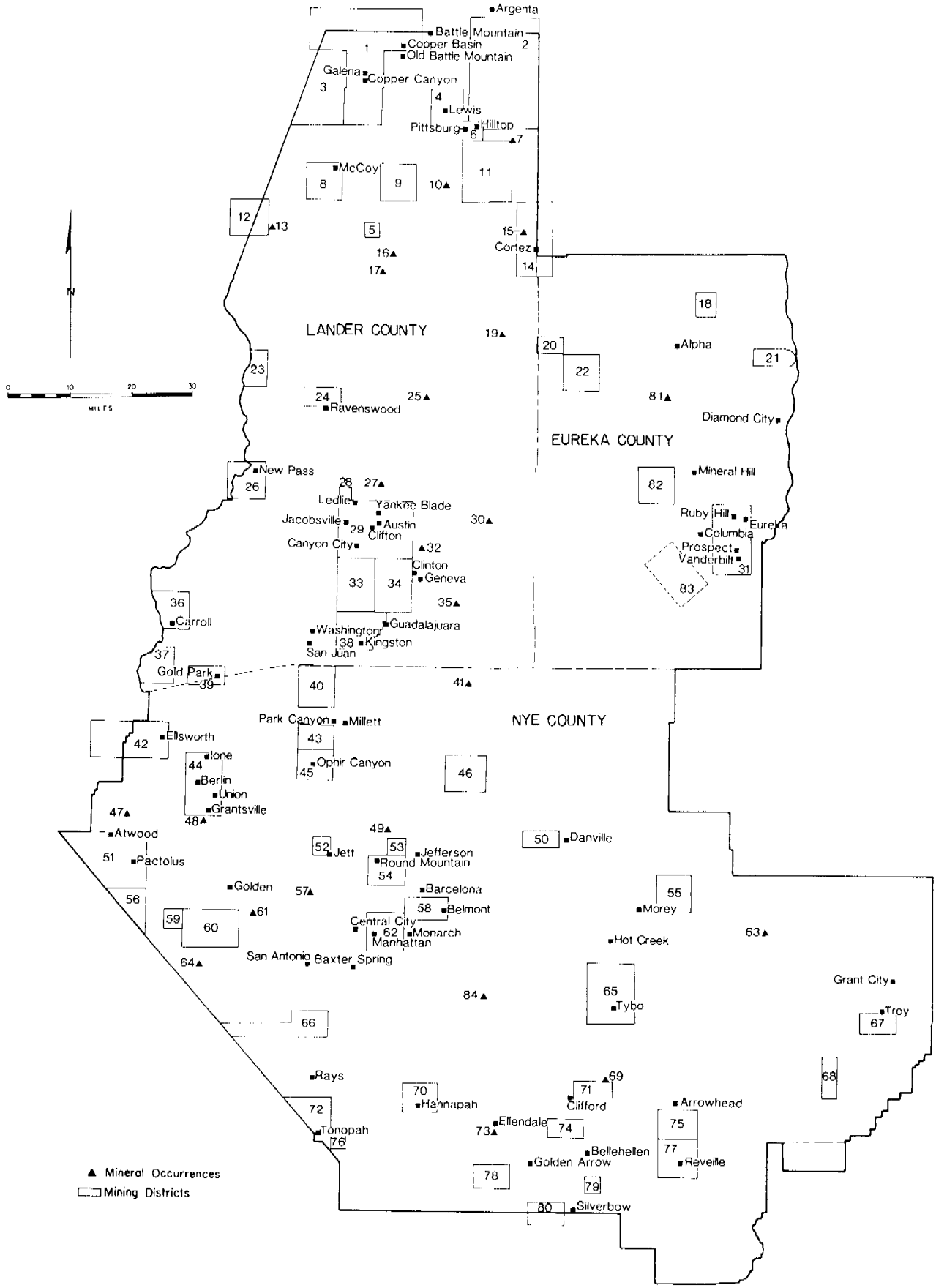
[1]Discovery at Sutter's Mill brought both gold seekers and publicity to the Far West. But for a number of years after 1848, national and international attention focused almost exclusively upon California and the Oregon Country, where gold fever was combined with an equally fervent lust for rich farmland. To a still largely agrarian society whose settlers were just then learning to live on the midwestern prairie, the dry western plains and mountain regions appeared inhospitable, even hostile. They were seen as distances to cross, not as places to live.

Little more than ten years later, when silver and gold were discovered at the head of Nevada's Gold Canyon and near Pike's Peak in Colorado, the United States had changed considerably, both demographically and economically. In the northeast, soil exhaustion drove many rural people to fast-growing industrial cities. At the same time, immigrants from Ireland, England and Wales began to arrive in large numbers, placing a considerable strain on the region's resources and creating a surplus labor pool. Finally, by 1859, California's gold fields had evolved beyond the abilities of individual miners to a high degree of industrialization.

In this context, discovery of precious metals in Nevada and Colorado sparked the imagination of thousands of frustrated '49'ers in California, and countless would-be miners in New England. Riches equal to or greater than those of California had been found on both edges of the Great Basin--an area of land many times the size of California. Just the possibility of finding another Comstock or Pike's Peak was enough to encourage large numbers of individuals and groups to explore the "vast wastes". Discoveries in central Nevada, Utah and Colorado during the early 1860's only confirmed what these men already guessed, or hoped.

[2]Perhaps the major reason capitalists and entrepreneurs of the early 20th century were wary of investing in new mining districts was that as a group they were much more sophisticated than their 19th-century predecessors. These 20th century industrialists and financiers were well aware of the mining investment frauds of the past century, and many fully understood, from their own experience, how these frauds were perpetrated. Thus, they were very suspicious of investments such as those offered in Tonopah, at least until the investment opportunity had proved itself.

[3]Nineteenth century prospectors, miners and merchants were an optimistic lot, willing to build towns and mills--to form a district--almost anywhere on any pretext. We know of those districts that fell quickly, by their conspicuous absence from the historical record; there is no mention in the census, no city directory, probably no newspaper. The histories of many of these "dreams that failed" could be reconstructed, some could not. In any case, such an effort is beyond the scope of this overview.



Map 7: Central Nevada Mining Districts, Camps and Towns, 1862-1920

Landscape and Arrangement of Mining Towns

Physical arrangements of mining communities, whether camps, towns or "cities" such as Austin and Tonopah, tended to follow certain patterns. The basic plan--which was not unique to mining country but rather a continuation of traditions developed in the east and midwest--began with a central core of commercial establishments. Beyond this core (which could be simply one street wide, or include several blocks to either side) were residences, and beyond these the many manifestations of mining: adits, headframes, mills, shops.

Because location of mining camps was determined simply by the location of ore, many camps and towns grew up in awkward geographical circumstances. Most fortunate were camps set up in broad valleys, such as Round Mountain, Pioneer and Prospect, where there was plenty of room for expansion and to lay out wide streets in a traditional mid-American grid pattern. Many others, however, were wedged into narrow, steep canyons that produced crowded conditions even when there were few people. Ophir Canyon, Tybo, and to a lesser degree, Austin, are examples of this. Tybo, in particular, was pinched into a narrow space, producing a long, strung-out community in which stores and houses on "Main Street" were backed close against the slopes on either side. In a few cases, two-part towns, or even two separate towns, developed. Tybo and Hot Creek both had "upper" and "lower" sections. At Reese River, the cost of town lots in Clifton was so great that miners and merchants moved further up Pony Canyon and began the town of Austin (Browne 1866:27).

On the other hand, towns built along railroad lines generally had plenty of room to grow, even if they seldom did. Appropriately, they were laid out with commercial main street running parallel to, and hard by, the rail lines. This orientation obtains today at Battle Mountain, and was likely the case in ephemeral towns such as Alpha, Ledlie and Blackburn.

Arrangement of buildings within mining towns and camps was not necessarily very orderly. This was due partly to geographical constraints, such as at Tybo, where there simply was insufficient room for everyone in the narrow canyon. But it was also in large measure due to the fact that camps were set up in a hurry, without benefit of formal laying-out, so that everyone could move directly to the business of getting rich. The result was often a certain chaos, particularly on the outer edges of a town. While "Main Street" would generally form a neat path through town, and sometimes

have one or two other streets running parallel to or across it, this pattern soon degenerated into a jumble of houses, corrals, tents, and dugouts, here and there interspersed with an occasional mine shaft or headframe. Looming above it all were the mines, and the large mills that spilled down the hillsides.

The physical remains of central Nevada's mining communities tend to give an erroneous impression of the past, largely because so little is left. Outer limits of camps and towns are roughly identifiable from the location of adits, tailing piles and other debris of mining activity, and it is possible to find "main street" either by the remains of commercial buildings or traces of a principal road. Much of what was erected between these features is gone, however: tents moved away, frame buildings dismantled for reassembly elsewhere or for their materials. First to leave a town would be those whose livelihood, and therefore housing, was marginal. Last to leave would be those with a substantial stake in the community, such as merchants, whose places of business, and often their houses, would be of more durable construction. Thus, where anything at all remains of a town, what is left is frequently from the central core and of stone or brick: materials much more difficult to remove than canvas and wood.

Industry: Non-Mining

> "Nevada is not in a position to compete effectively in manufacturing, since it lacks sufficient water to satisfy certain industries and fuel resources for even its own heavy industries, while coal is plentiful to the east and oil to the west. Moreover, labor costs are high and the state is too far from sources of many necessary raw materials." (Elliott 1973:345)

This situation of today certainly existed in 19th and early 20th century central Nevada, and was exacerbated by extremely primitive transportation systems and a probable lack of interest in manufacturing when riches could come so much more quickly (theoretically at least) through mining. Thus, central Nevada's history includes only a few instances of industry apart from extraction and processing of ores, and, of these, many were mining related.

One such industry was manufacture of charcoal, which was developed to meet the requirements for an efficient fuel for the smelters and roasting furnaces of the region's mining districts. Another industry--also mining related--was salt production. Salt was collected from desert playas and was used in both the pan amalgamation and the Reese River roasting processes (Young & Budy 1979:115). During the 1870's and early 1880's, there were a number of "salt works" in the region. Williams' salt marsh, in Diamond Valley north of Eureka, encompassed 1000 acres of salt flats, and used large pans in which to evaporate water. With 22 such pans, the works were able to produce 5000 lb. of salt per day (Angel 1881:436). Other recorded "salt works" included Spaulding's, in Big Smoky Valley, and Columbus Salt Marsh near San Antonio (Blume 1977: II-23).

One more "industry" of interest chiefly as an oddity rather than an important factor in the region's history, was a "pebble factory" owned and operated by Omer Maris, who with his wife Cora came to the Toquima range about 1916. Maris located a large deposit of chalcedony, and designed a mill built by the Cambell-Kelly foundry in Tonopah, to convert chunks of rock into pebbles. Pebbles were used in mills to grind ore, and had previously come to the US as ballast in ships sailing from Scandinavia. Maris' operation lasted only 3 years, before he moved on to other pursuits. As late as 1971, however, there remained, in a valley between Belmont and Manhattan, the Maris homesite, powder magazine and mill (Maris 1971).

Like these small industries, charcoal manufacture depended on availability of the right raw material in quantity--in this case pinyon and juniper wood from the region's mountain forests. As noted above, central Nevada ores required roasting with salt before amalgamation took place. During the 1860's, reverberatory furnaces were used at Reese River, fueled with wood from surrounding forests, the cost of which was nearly 60% of the total cost of milling (Young and Budy 1979:115).

In 1869, German engineer C. A. Stetefeldt designed a far more efficient furnace. First used on a large scale to reduce "rebellious" ores from Reese River mines, "the Stetefeldt furnace [also] became the standard roasting mechanism for the central Great Basin," until the cyanide milling process replaced roasting and amalgamation at the turn of the century (Young and Budy 1979:115). That same year, G. C. Robbins' small "demonstration" smelter opened the way to exploitation of the Eureka district's lead-silver ores. Efficient smelting, however, required temperatures significantly higher than those needed for roasting. To achieve proper temperatures, processors of Eureka and other lead-silver ores turned to charcoal.

The charcoal industry thus developed first in forests near Eureka in the early 1870's, (Young and Budy 1979:116; see also Welch 1979, Grazeola 1969, O'Neill 1976). At first, pinyon and juniper wood was cut, dried, then burned in earth-covered pits. Utah juniper and curlleaf mountain mahogany were also burned, but they required higher temperatures than those obtainable in pits. So the industry turned to kilns, which could produce the required drafts.

Kilns were beehive-shaped structures, built variously of stone, adobe, fire brick or any of these in combination. The height of a kiln was equal to its diameter, which could range from 16 to 26 feet, and wall thickness ranged from 30" at the base to 12-18" at the top. Each had two large openings, one at ground level at the front, the other higher up, at the rear, for stoking, and 2-4 rows of vent holes a few inches above ground (O'Neill 1976:2).

Most writing on central Nevada's charcoal industry has concentrated on the Eureka area--for it was indeed a major producer of the fuel. Charcoal burning has received attention in studies of Nevada's immigrant populations as well (Grazeola 1969, Earl 1969, Shepperson 1970), because it was almost entirely dominated by Italians and immigrants from that part of Switzerland linguistically and culturally related to Italy. According to the federal census of 1880,

these men (very few had families) accounted for nearly 12% of Eureka County's population. Census population schedules for that year show Italian and Swiss charcoal burners in concentrations throughout the Eureka area, particularly North Ruby Hill, Fish Creek Wells, the Williams Range, the McGarry District in the Diamond Range, in and around the Dunderberg and Hamburg mines, Spring Valley, Secret Canyon and Cedar Creek. They were also prominent in the railroad town of Alpha. Ironically, only 3 kilns have been recorded from the Eureka area, and two of them (1080, 1049) are in poor condition. The Philipsburg kiln (1079) constructed of stone, has been reported as intact and is protected by a fence.

Another center of charcoal production, although short-lived, was located in the Tybo-Hot Creek area, where lead-silver ores were produced beginning c. 1874. In 1877, the Tybo Consolidated Co. hired Henry Allen of Eureka to build no fewer than 15 kilns near Hot Creek (Eureka Sentinel 2 Sept. 1879, quoted in O'Neill 1976:4; Angell 1881:524). These were of brick, most likely obtained from nearby Belmont which had a sizable brick industry. There remain today seven charcoal kilns in "Kiln Canyon" west of Tybo, and others in Sixmile and Fourmile canyons. Associated with the kilns in many cases are remains of dwellings, probably once occupied by charcoal burners, and several sites which may be associated with Shoshones who lived and worked on the fringes of the Tybo-Hot Creek communities. As at Eureka, Tybo's charcoal industry was dominated by Swiss and Italians, who at day's end took their ease in taverns such as the Coal Burners' Rest and the William Tell.

Central Nevada's pinyon-juniper woodlands supplied not only the charcoal industry in Eureka and Tybo, but also provided materials for building in all parts of the region. Much of this timber was simply cut, peeled and roughly worked for use on roofs, for fenceposts, corrals, and door and window framing. Well-milled lumber was scarce and expensive in 19th century central Nevada, and much of the best, used for "finishing and particular work" was imported from western Nevada and California (Nev. Surveyor Gen. 1866:70; 1879-80:29). Although mining companies probably accounted for most of the lumbering and milling in the region, sawmills supplying town markets were not unknown (but not currently listed by BLM-Battle Mountain). In 1864 there was a steam sawmill at Washington, and "good quality" lumber (pinyon or digger pine) was produced at a mill at Silver Creek. The latter mill moved to Big Smoky Creek in May of that year, and was supplemented by a machine to cut shingles that would replace "the straw and dirt that builders have in great measure been compelled to use" (Reese River Reveille 3 May 1864:1; 7 May 1864:2; 14 May 1864:2).

As local sawmills supplied much-needed building lumber, the lime industry provided material for masonry construction, again principally for town consumption. Probably very small in scale, this industry produced powdered lime from local limestone for use in high quality mortar. Lime burning, or "calcining" of limestone could be done over an open fire, but kilns were more often used. They were constructed of stone or brick, and polygonal in shape. Many 19th century kilns were lined with firebrick, creating a "barrel-shaped" interior. Where possible, lime kilns were built into a hillside, to permit loading from the top. Burned lime was removed through an opening near the base, which could be closed to control drafts (McKee 1973:62-63). According to the Reveille (27 June, 1863:3), an early instance of lime production was located "about 6 miles south" of Austin and operated by John L. Means. To date, only one lime kiln has been identified in the study area, in the Toiyabe Range at the southern end of Crescent Valley (141), and a lime pit has been reported near the Tybo Charcoal Kilns.

Liquor manufacture in Nevada also required a raw material, but in this case one supplied by farmers. As early township survey maps show, barley was an important crop in the first decades of agriculture in the region. Much of this barley ended up at local breweries, where it was converted to ale and whiskey.

All Nevada's larger towns had at least one brewery in the 19th century. Breweries did a brisk local business, as census records and city directories of the period show in their numerous listings for tavern keepers and liquor dealers. They may also have supplied the region's mining camps, where the saloon was prominent in the local business community. Although German immigrants participated in many aspects of Nevada history, as farmers, ranchers, dry-goods merchants, grocers, etc., they appear to have dominated the brewing industry. McKinney (1878) lists 9 breweries in the region, most with good German names: Bauer and Schonwald at Austin, Amfahr at Battle Mountain, Bauer at Belmont, Bremenkopf & Regli, Lautenshlager, Mau and Heitmann at Eureka, and Leschner, Valentine and Co. at Tybo.

Immigrants

The fact that the foreign-born made up a significant proportion of Nevada's 19th century population has been recognized by Elliott (1973) and Shepperson (1970). This strongly international flavor was characteristic of many western mining camps (Smith 1967:24), but in Nevada the numbers were astonishing. According to Shepperson (1970: 13-14), foreign-born comprised 44.2% of the state's population in 1870, and 41.2% in 1880. This massive immigration of foreigners to Nevada made it "one of the top ten foreign-born states in America for more than seventy-five years" (Shepperson 1970:14).

Although a detailed statistical analysis of population origins was beyond the scope of this study, even the briefest perusal of manuscript census returns from central Nevada reveals the extent to which foreigners participated in development of the region. However, association of various immigrant groups with cultural resources in central Nevada is a more difficult proposition. In some states, it is possible to associate such groups with churches or particular geographical areas of settlement. This is not the case in central Nevada, however: the absolute number of churches in the region was always quite small, and each thus served worshippers of many nations at once. And excepting the Chinese, who for the most part were isolated in ghettos, foreign-born inhabitants moved about the region and within its communities as freely as did the American born population, lived in the same kinds of dwellings and used the same material goods as did Americans. Furthermore, attrition of buildings and structures, through removal, destruction or deterioration has in many cases left few physical remains to associate with anyone, let alone specific groups.

There are a few exceptions, however. As noted previously, the principal non-mining industrial activity in central Nevada was charcoal manufacture, carried out almost exclusively by Swiss and Italians. A number of charcoal kilns remain; the greatest number are in the Tybo-Hot Creek area, but investigation in the canyons and valleys around Eureka may locate more. The Tybo area also contains dwellings that may also be associated with the charcoal burners.

Immigrants who participated in the agricultural, rather than the mining, economy can in a number of instances be clearly associated with cultural resources. Many early ranches are still extant, and through them it may be possible to recognize the role of German, Irish, Italian and Basque immigrants in the settlement and subsequent development of central Nevada's agricultural community.

Racism prevalent in the 19th and early 20th centuries effectively relegated the Chinese population (as well as native Shoshone and Paiute inhabitants) to a status well below that of the larger, relatively fluid, Euro-American society of camps and towns. Chinese labor, however, was instrumental in construction of the Central Pacific Railroad, which first brought these immigrants to central Nevada (Lingenfelter, 1970:115). Upon completion of the railroad, the Chinese were discharged and left to fend for themselves. Battle Mountain, on the Central Pacific line, had a Chinese community by 1870 (1870 Federal Census, Lander Co.). The 1880 census found Chinese in both Lander and Eureka Counties, and not necessarily working on railroads, although the camps of Evans, Diamond and Alpha (on the Eureka-Palisade line) as well as Cortez, Austin and Eureka, contained groups of Chinese laborers. Chinese also worked as miners, although their employment as such was extremely unpopular in the Euro-American mining community and with local businessmen. Apart from racism, the principal issue with these groups was the low wages paid to Chinese miners. Caucasian miners resented being displaced by "cheap labor," and businessmen feared that low wages, and disinclination of the Chinese to spend lavishly, would mean less money flowing into and through the local commercial sector (Lingenfelter 1970:108). However, in 1880 Chinese miners could be found in significant numbers in Galena Canyon, Lewis and around Argenta. It is interesting to note that in Argenta the large contingent of railroad laborers was wholly Caucasian, including Americans, Irish and Germans.

Anti-Chinese feelings sometimes led to formation of clubs dedicated to driving the immigrants out--out of town if possible, and certainly out of jobs coveted by whites. Such a group was organized in Eureka in 1876, and another at Tybo in the same year. The Workingmen's Protective Union rose in response to the Tybo Consolidated Company's importation of Chinese from Eureka to work in local mines. No sooner had the Chinese arrived than the Protective Union began armed threats. Tybo Consolidated quickly backed down, and the Chinese went back to Eureka in wagons thoughtfully provided by the Union (Lingenfelter 1974:123). Nonetheless, according to the 1880 census, Tybo did retain a small community of Chinese laborers.

Because the Chinese, partly by preference and certainly by force, lived together apart from the surrounding Euro-American society, it may be possible to locate structures or archaeological remains associated with their lives in central Nevada camps and towns. Such a site (516) has been identified at Old Cortez; perhaps others may be discovered at some of the places mentioned above.

Apart from the Chinese, most immigrants to central Nevada appear to have suffered only slight ethnic discrimination, although organizations such as the Ku Klux Klan and the American Labor Union campaigned periodically against the dominance of the foreign-born in so many of the mining towns and camps (Shepperson 1980:124). The "Charcoal Burners' War" of 1879, a series of incidents in and around Eureka culminating in the death of 5 Italians at Fish Creek, was the result of an attempt by charcoal burners to obtain higher prices for their product, and only incidentally an effort to put down a particular ethnic group (Earle 1969, Shepperson 1970, Grazeola 1969). In general there were simply too many opportunities, too many tasks to accomplish, for Americans to object too strenuously to the participation of foreigners in the life and economy of the region.

As on many of the West's hardrock mining frontiers, the Cornish and Welsh, highly skilled men from a long tradition of underground mining, were prominent in central Nevada's mining industry. Irish were well-represented, particularly in the mines and in railroad gangs, but they also ran saloons, farmed, and operated stage stations, and otherwise participated in the region's economic life. Many Germans became successful ranchers or merchants, for example Reinhold Sadler, who owned a general merchandise emporium on Eureka's Main Street and a ranch in Diamond Valley (2150), and later became Governor of Nevada. Another German immigrant who did well was George Ernst, who had large livestock holdings in Hot Creek and Monitor Valley (2189), was County Surveyor 1872-76, was elected County Auditor and Recorder for 1878-80, and went to the Nevada Legislature in 1880. Scandinavians also came to central Nevada; around Eureka in particular, they and Canadians numbered significantly in the lumbering or "woodcutting" industry.

> "Here were congregated the most varied elements of humanity and the most various types of human character: persons belonging to almost every nationality and every status of life--the Irishman, the Englishman, the German, the Italian, the Frenchman, the Russian, the fair-haired Scandinavian, men from every State in the Union . . . all blended into one homogeneous equality" (Leadville Daily Chronicle, 19 June 1879).

The reporter was describing a Sunday gathering in Leadville, Colorado, but it could have been written for almost any 19th century western mining town on any day of the week. Such a society, in central Nevada or elsewhere, was not, however, homogeneous, which made it all the more interesting. On the other hand, there was a rough equality, particularly in the

early days, as people from many nations applied themselves to making their fortunes in a turbulent, transient and everchanging society.

Commerce

Commercial development in central Nevada was closely tied to, and indeed almost totally dependent on, success or failure of the region's mines. Successful business depended upon a substantial market, which was only to be found at significant concentrations of people. Thus few businessmen remained in an area once mines and their attendant camps closed, despite farmers' and ranchers' continual need to purchase goods and equipment.

The kind and number of business establishments depended largely on the longevity of the community. Often the general store was first to arrive and last to leave. "This nineteenth century department store carried a variety of goods, including dry goods, groceries, clothing, medicine, hardware, notions, liquors, agricultural implements and mining equipment, all crammed into one or two rooms. . . . The activity of this emporium was not limited to consumer business. Often the miner could sell his gold or silver bullion, and the farmer could find a market for his produce. As a profitable sideline, the store might also serve as the local bank and post office" (Smith 1967:101).

Equally ubiquitous were hotels and livery stables. In a region characterized by the extreme transiency of much of its population, hotels played an obvious role. Livery stables, in that era of the horse and mule, were the region's 19th and early 20th century version of the later gas and service station, and served the same function: to provide fuel for and repair (or rest) of the principal means of transport. Most numerous were taverns and saloons, which not only provided recreation, but acted as important centers for the gathering and exchange of news and information, the source of rumor and site of many business transactions.

As camps grew into towns, businessmen came to specialize more, and the variety of their enterprises increased. In 1878, for example, the camp of Ellsworth in Nye County had directory listings for an assayer, two mill agents, two general merchants and an hotelier (who likely provided livery services as well). Battle Mountain that same year boasted a meat market, bakery, restaurant, blacksmith and wagon maker, lumber dealer, boot and harness maker and even a hairdresser, as well as a hotel and several saloons and general stores (McKenney 1878:176,183). Seldom included in directories, but often present in camps and towns were laundries, most operated by Chinese (Smith 1967:103). Many towns included at least one attorney, who handled the litigation inevitably arising from conflicting mining claims and questionable

deals; and the largest population centers invariably attracted a physician or two (Ross, c. 1957).

A town may have felt some reason to boast when an agent of the prestigious Wells, Fargo and Co. of San Francisco opened for business on Main Street. Although Wells, Fargo established only one bank in the study area (Austin in 1869), its agents could be found in several towns, among them Battle Mountain, Belmont, Jefferson, Tybo and Grantsville (Wells, Fargo & Co. Directories 1871, 1879, 1881). Agents were as a rule men, but there is at least one recorded instance of a woman agent, Miss O. M. Crockett of Austin in 1894 (Wells, Fargo & Co. Directory, 1894).

Wells, Fargo agents substituted for actual banks in camps too small or unstable to interest other bankers. Larger towns, however, drew other banking interests. An early institution was Paxton and Thornburg (later Paxton and Curtis) of Virginia City, which opened a branch office in Austin in 1863 (Shields, research notes). By 1880, Paxton and Co. had expanded to Eureka and Belmont (McKenney 1881). The Eureka branch was later (1885) reorganized under new management as the Eureka County Bank (Shields, research notes).

Official state records on banking were not established until 1908. According to the State Bank Examiner's first report (1908), there were 5 state banks and two private banks in the study area, including the Eureka County Bank, Bank of Manhattan, Nye and Ormsby County Bank (operating in Carson, Tonopah, Reno, Manhattan and Wonder), and the Round Mountain Banking Corp. and Horton Banking Co. in Battle Mountain. The first decade of the 20th century was "one of the most important" in Nevada banking history, as it saw establishment not only of the post of State Bank Examiner, but also the Nevada Bankers' Association and no fewer than 26 banks around the state within the first five years of the Tonopah boom (Shields 1953:8,9).

Buildings that housed central Nevada's commercial enterprises were as varied as the businesses themselves and, to a certain extent, reflected the outlook and condition of the town or camp as a whole (Smith 1967:101). In a camp's earliest days, canvas was often used to shelter the first business establishments: a tent was quickly erected to take immediate advantage of opportunity, and could be as swiftly dismantled should the boom prove a bust. One such establishment was "the Annex" at Tonopah in 1905, "a neat place with six beds curtained off in a tent with board sides" (Spaulding, 30 March 1905). In the first days of Manhattan, the Tonopah

Lumber Company also operated out of a tent (Berg 1942:103). The tent, however, did not present an appropriate facade of substance and prosperity, and was soon fitted with a wooden false front, or replaced entirely with a more permanent structure. Some of these "permanent" structures were only so in a relative sense, as they were moved, like houses, from place to place as mining fortunes rose and fell. Perhaps the most famous instance of this phenomenon was Austin's International Hotel, originally built in Virginia City and moved to Reese River in 1863, where it played a long and prosperous role in the community (Bunning 1977:13).

If mines in an area proved (or at least appeared) viable, camp merchants were often the first to reflect this fact in the construction of their establishments. Out of the initial jumble of tents would rise an identifiable "main street" lined with one-story frame buildings, with vertical plank or board-and-batten sides, and pitched gable roofs hidden behind more imposing (often bracketted or otherwise adorned) rectangular facades. If prosperity continued, merchants turned to stone and brick construction. The importance of masonry in retarding fires was well known, although total protection was impossible. Masonry construction, particularly brick (which had to be manufactured and thus was fairly expensive) was also to no small degree a matter of commercial prestige.

Commercial architecture in central Nevada was conservative, expressing prevailing popular traditions. Except for the odd mine shaft and tent, mining town main streets resembled main streets throughout small-town America, particularly towns of the trans-Mississippi west. The most flamboyant structures were found in the big towns of Eureka, Austin and Tonopah, where there was time, money, business and competition enough to warrant lavish expenditure. Elsewhere, the simple storefront, with touches of decoration at the cornice, was generally the rule.

The most numerous and best-preserved examples of commercial building in the study area are found in Eureka, Austin and Tonopah, which of the many towns that once dotted the region are the only ones (along with Battle Mountain) to have survived as reasonably viable communities. In abandoned (or nearly abandoned) towns, natural deterioration, scavengers and vandalism have destroyed many buildings. Identifiable commercial structures do remain, however, in Berlin, Belmont and Ione. In Manhattan, the Edison Power Co. substation, built early in the 20th century in a vaguely Mission style, still survives. Another building in Manhattan, constructed of rock-faced stone, is an excellent example of the turn-of-the century small town bank: single story, with wide

entrance let into a chamfered corner. In Tybo, the Trowbridge store, built of brick from Belmont in 1877, displays a round-arch "arcade" across the front which was certainly imposing in its day.

Transportation

The history of transportation in central Nevada is characterized by a demand that far outran supply until well into the 20th century. Transportation systems were required to move not only people but large quantities of ore, machinery and equipment, dry goods and food over great distances and difficult terrain, and without benefit, for the most part, of good roads. Few silver strikes were made adjacent to well-marked roads (Reese River being the notable exception); instead, roads were forcibly imposed upon the landscape in the wake of the prospectors. Lack of proper roads, however, did not deter people from going where they would: early township survey maps are crisscrossed with trails, many of them clearly going someplace, others disappearing into the foothills or wandering inconclusively through the valleys.

As noted previously, the earliest roads of central Nevada ran east-west, moving travellers and communications through the region. Once William Talcott's discovery in Pony Canyon brought people to Reese River, however, there began swift, if informal, development of roads throughout the area. Although they went in all directions, the trend, following the topography of the land, was north-south, and a number of valleys, such as Hot Creek and the Big Smoky, became major thoroughfares due to their strategic location near or between centers of mining activity.

The earliest formally established roads, beyond the Humboldt and Central routes, were toll roads enfranchised by the territorial legislature, and their location was simply a function of the greatest need (Maupin 1961:2). Although counties were theoretically responsible for designating routes, few had the funds to accomplish this. Instead, counties left the initiative to private enterprise, at least until they could exercise their right to purchase the roads (Angus, n.d.,n.p.).

Early sessions of the legislature devoted considerable time to granting toll franchises (Angus, n.d.). An early toll road into the study area was granted to Moses Job and E. Penrod, ending "at a point where the stage road, known as the Simpson Route, crosses Reese River, with toll privileges for 20 years" (Laws of Nev. 1 Sess. 1861:36). Another example was Thomas Luther's 1864 road from a quartz mill in Upper Austin along a route "deem[ed] most practicable" to Geneva in Big Smoky Valley (Laws 1864:7).

In the early years of the region's development, these toll franchises were no doubt quite lucrative, as the roads were heavily used not only by travellers but by freighters, whose large teams and wagons would mean substantial fees (Angus, n.d.). But soon freighting and stage companies developed their own routes, as there was much competition among them to establish the "shortest," or at least a less arduous, way from one place to another and thereby increase their business.

Stage and freight lines were crucial to development of the region. They carried passengers and mail, and they brought from vast distances--California, Salt Lake, Virginia City--food and material goods of daily life, as well as every conceivable tool, item of equipment or piece of machinery needed at the widely-scattered mines. Construction of railroads did little to hamper business, as the two major lines, the Nevada Central and Eureka-Palisade, extended south from the Central Pacific only as far as Austin and Eureka. Instead, freighting played an important role in central Nevada until well into the 20th century. The continuing primitive state of the region's transportation systems (in contrast to the sophistication of its mining technology) was witnessed by Episcopalian churchman F. S. Spaulding, who in 1905 on the road between San Antonio and Austin saw a nine-pair team of horses hauling a gasoline engine and hoist (Spaulding, 6 April 1905).

To understand the importance of the freighter in central Nevada's development, a single example is illustrative. In February, 1909, Walter G. Francis opened a partnership "in the teaming business" with G. H. Givens in Austin. Francis' business record for that year reveals an astonishing variety of jobs. He hired out to the county, to Austin Consolidated, to local individuals; he rented saddle horses, buggy and hearse teams, and whim horses. Among his cargoes were coal, hay, furniture, "cows," Wells Fargo packages, dirt, manure and lumber (Francis 1909).

In order to operate effectively over the long, isolated distances between mining camps, freight and stage companies, particularly in the early years, developed and maintained their own routes and furnished them at intervals with stations, as had the Pony Express and Overland ventures before them. Later stations might develop at existing ranches, or be established on the initiative of individuals along the routes. In July 1863, G. W. Jacobs organized a stage line from Austin to "the Humboldt mines." His men were set to work constructing roads, bridges and stations, the latter well-provisioned for "men engaged on the route" (Reese

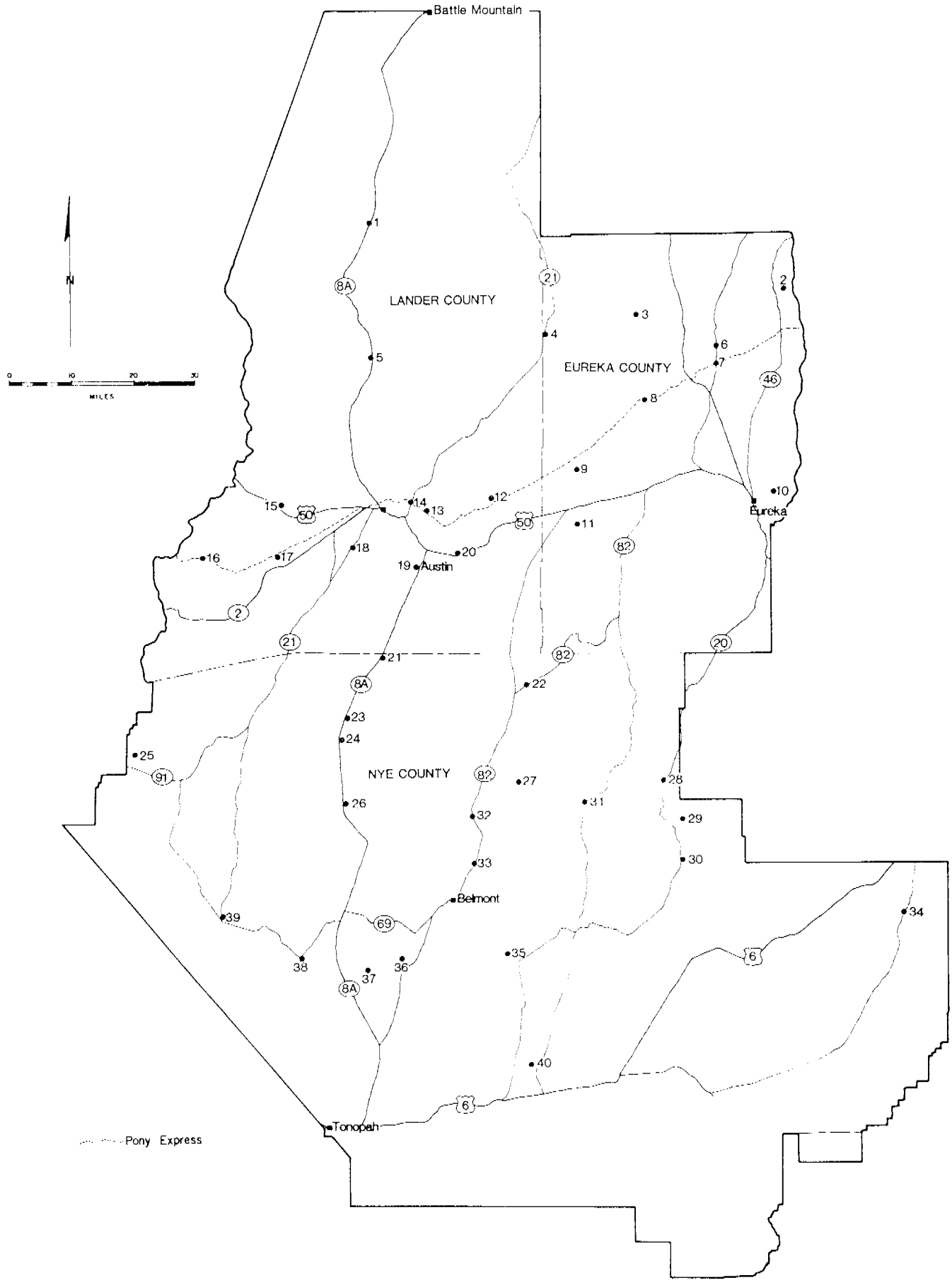
River Reveille, 1 July 63:3). From Eureka, W. L. Pritchard's Fast Freight developed service to Pioche in 1871, with stations along the 120-mile route (Eureka Sentinel 13 March 1871:3). Pritchard also operated through Hot Creek (Sentinel 14 Jan. 1871:3) but little evidence of his station remains on the ranch still known as "Pritchard's Station" (315).

Other stations along the 1870's Eureka-Tybo route included Summit (2195), east of Park Range, Hicks' (1013) in the valley between the Park and Upper Hot Creek Ranges, and Moore's (316) below Pritchard's. At least one station on the Tybo-Belmont route has been identified in the Monitor Range. Appropriately known as McCann's Station (2172), it was operated in the 1870's by Barney McCann and his wife, Grace, both immigrants from Ireland. An early station on the Austin-Belmont road in the 1860's and 1870's was Elijah Smith's, also known as Stone House (2184). Other Monitor Valley stations included Thomas Morgan's (1044), and Pine Creek (2189). Further west were Cloverdale (352), which may date back to the establishment of a "free road" from Belmont to West Gate in 1867 (Nevada Surveyor General, 1867-68: 139-40), and Baxter Spring (363). Some of these stations operated for many years, and were augmented by new ones as population movements required: for example, Spanish Spring (364) was developed in 1905 as a stage stop on a road between Manhattan and the new boom town at Tonopah (Blume 1977:II-39).

Stage and freight stations were basically simple affairs, although they might develop into sizable ranches with the passing years. The simplest consisted of a small dwelling, built of the most easily available materials, with an attached stable and corral. Log, adobe, and uncut stone were common construction materials, used informally and with strict attention to the utilitarian (Lass 1972:104). Stations served as rest stops for teams, drivers and stage passengers, and often all slept in the stable (Lass 1972:105). A stage or freight station was often a family enterprise. The census enumerator in 1880 counted at Moore's Station (316) in Hot Creek valley five men: agent William Moore, his brothers E. C. (a driver) and Walter (a mail carrier), a cook, and another stage driver. Further north, however, C. W. Hicks' station, which was also a ranching operation, included his wife and daughter. Families were also recorded at McCann's, Morgan's, and Smith's stations in 1870 (1870 Federal Census, Nye Co.; Tybo Sun 3 Nov. 1877:3).

Some stations, due to location and amount of traffic, could be quite extensive affairs. One of the best known is San Antonio in Big Smoky Valley near Peavine Creek. At this station, which served travellers en route to Belmont, Death Valley, Silver Peak and Gold Mountain, a two-story, L-plan

1. "Stage Station"
2. Diamond Station (Cox)
3. Tonkin Ranch
4. Walti Hot Springs
5. "Stage Station"
6. Romano Ranch
7. Sulphur Springs Station
8. Roberts Creek Station
9. Grubbs Well Station
10. Shannon Station
11. Willows Station
12. Dry Creek Ranch
13. Simpson Park Station
14. "Overland" Station
15. Mt. Airy Station
16. Smith Creek Station
17. Dry Wells Station
18. Silver Age House
19. Birch Creek Ranch
20. Cape Horn Station
21. Minimun's Station
22. Potts Ranch
23. Millett Ranch
24. Tate's Stage Station
25. Craig's Station
26. Darrough Hot Springs
27. Morgan Ranch
28. Hicks' Station
29. Pritchard's Station
30. Moore's Station
31. Clear Creek Ranch
32. Pine Creek Station
33. Smith's Station
34. Blue Eagle Spring
35. McCann Station
36. Spanish Spring
37. Baxter Spring
38. San Antonio
39. Cloverdale Ranch
40. Stone Cabin



Map 8: Pony Express and Stage/Freight Stations, and Proximity to Present Roads and Highways

building of brick and adobe was built in 1865, said to contain 20 rooms (Blume 1977:II-23,24). Most stations, however, were probably relatively small, and structures associated with their activities, such as barns, stables and corrals, were in many cases soon integrated into larger ranching operations.

While freight and stage companies operated throughout the study area, expanding and redirecting their routes as movement of the mining population dictated, railroads in central Nevada were far more limited in their geographic scope. The first rail line through the region was the Central Pacific, part of the nation's first transcontinental route, which was built along the Humboldt in 1869. Opening of this line was a major boon to the region, because, despite difficulties over high freight charges, it brought in mining equipment and machinery more swiftly than could freight companies, provided a means for shipping out ore, and proved an important boost to the region's livestock industry during the 1870's and 1880's.

However, the Central Pacific ran far to the north of most mining centers in the region, and additional service was clearly required. Two narrow gauge lines were developed off the Central Pacific, the Nevada Central from Battle Mountain to Ledlie (connecting with the Austin City line into that town) in 1880, and the Eureka-Palisade in 1875. These were supplemented with shorter lines, the Austin City (or Mules' Relief), and the Eureka-Ruby Hill (1875). These railroads, however, were developed largely to serve major mining centers already in existence, and thus contributed little to development of new regions. Indeed, the Battle Mountain-Lewis (1881) operated little less than one year, and was discontinued once the mines at Lewis were closed (King 1954:74; see also Myrick 1962).

Lack of railroad service was a hardship recognized early on in the development of the region, particularly Nye County. Indeed, the southern portion of the study area lacked a railroad until the Tonopah mining boom occasioned the construction of several, such as the Tonopah (1904) and the Tonopah-Goldfield (1905) (Elliott 1966:23-24). As early as 1865, the Nye County assessor noted that "The most serious obstacle to the cheap production of the precious metals in this section . . . is found in the high prices required to be paid for the transportation of freights . . . [thus] exhibiting the supreme importance of railroad connections between this section and our principal points of supply" (Nevada Surveyor General, 1865:66). Over twenty years later, the situation was no better:

> In relation to the railroads as a means of cheap transportation, we have not a mile of track in our county; in fact we are completely isolated from the outside world. . . . All our articles of import or export have to be hauled by teams, at a heavy expense, over 100 miles to the nearest point of railroad communication, to wit: Eureka, Ledlie or Sodaville (Nevada Surveyor General, 1887-8:109).

This plaintive comment underscores both the limited participation of railroads in the region's development, particularly in Nye county, and the continued importance of the freighting companies. Indeed, by the turn of the century, the Nevada Central Railroad had grown so inefficient that the line's contract to carry mail from Battle Mountain to Austin was cancelled and awarded instead to "an ox teamster to ensure more rapid delivery" (Tonopah Bonanza 23 Jan. 1904:4).

Little remains to mark the existence of central Nevada's narrow gauge railroads. Their existence fostered the development of only one town in the study area of note (Battle Mountain, which had the advantage of location on the Central Pacific line as well), although water stations and flag stops such as Blackburn, Alpha, Watts and Caton's presumably entertained visions of greatness common to all railroad towns. Both the Nevada Central and the Eureka-Palisade were abandoned in 1938. The rails were torn up and sold for scrap during World War II, and machine shops, roundhouses and other railroad buildings at Battle Mountain, Austin and Eureka are long gone, although remains of the station at Eureka still stand and are being used as a barn. The principal physical legacy of the railroads is miles of abandoned grade, perhaps a few decaying bridges, and numerous shacks, dwellings and ranch buildings constructed with railroad ties.

Agriculture

> "The western range is largely open and unfenced, with control of stock by herding; when fenced, relatively large units are enclosed. It supports with few exceptions only native grasses and other forage plants . . . and can in the main be restored only through control of grazing. It consists almost exclusively of lands which, because of relatively meager precipitation or other adverse climatic conditions, or rough topography or the lack of water for irrigation, cannot successfully be used for any other form of agriculture." (Clawson 1950:1)

Apart from mining, the most important contributor to the economy of central Nevada has been the range livestock industry. The land here is, by and large, unsuited to "any other form of agriculture," but through human perseverance and determination, it has historically supported significant numbers of cattle and sheep. "Sagebrush-grass range" offers "an abundance of grasses and weeds growing around and under sage"; spacing of trees in the pinyon-juniper range has allowed the growth of "considerable browse," ideal for spring grazing. Salt-desert shrub range features shadscale, budsage and a variety of grasses, and has been considered "fine winter range" for both sheep and cattle. Southern desert shrub (or creosote) range (found only in the extreme southern portion of the study area) provides year-round grazing for cattle and is used as winter sheep range (Hazeltine 1961:1-8).

Exploitation of these ranges has been characterized by the need to act within certain unavoidable constraints: lack of abundant water; severe climate, especially in winter; and the fact that the central Nevada rangelands are ecologically quite fragile and will support very few animals per acre. Achieving a balance between use and conservation of the region's rangeland has been a recurring problem in the area's agricultural history, and is still a political and economic factor today.

Although central Nevada's agricultural landscape has for many years been characterized by a small number of widely-spaced ranches and enormous grazing areas, all exclusively geared to range livestock production and largely independent of the mining economy, this has not always been the case. Particularly in the early decades of the region's development, mining booms created demand for a wide variety of foodstuffs. These garden crops were produced on farms located near mining communities that provided a ready and voracious market, since the alternative was importation of food at great expense from

California, Utah, and the valleys of western Nevada (Reese River Reveille 18 Feb. 1965:2).

Early issues of the Reese River Reveille offer examples to indicate that farming came to central Nevada hard on the heels of the miners. On 16 May 1863, the Reveille noted a "goodly number of ranchers" already located in the Reese River Valley (p. 2). Subsequent issues announced the first barley crop (sown by George Wilson, who also grew vegetables) (Reveille 30 May 1963:3), and "Mr. Mason's" trading post and store "on the emigrant road" which was to be supplied with potatoes and other vegetables from Mason's own gardens (Reveille 3 June 1963:3). As summer wore on, readers followed local agricultural progress: onions, potatoes, cabbages, and turnips, and even cucumbers were ripening and would soon appear in Austin's hotels and stores (Reveille 15 July 1963:3; 29 Aug. 1963:3). Some vegetables no doubt came from "O'Neil's ranch, eight miles down from Jacobsville," where crops included potatoes, corn, barley, and "a variety of salads and greens" (Reveille 23 May 1963:4). More distant farmers, such as Sabin Nichols and Robinson, Talcott & Co. in Grass Valley, were yet "near enough" to furnish the Austin market with peas, onions, lettuce, cabbage and watermelon (Reveille 16 June 1963:3; 4 July 1963:3).

Production of foodstuffs was not limited to Reese River country. The Nye County assessor in 1866 noted "excellent vegetables" growing in Monitor and Big Smoky valleys, including nearly 100 tons of potatoes (Nevada Surveyor General 1866:83; Berg 1942:60). Twenty years later, the list of valleys "in which farming [was] conducted to any extent" included Indian, Peavine, Hot Creek and Antelope valleys. In 1879-80, the Eureka County assessor reported production of onions, cabbage, corn, potatoes, carrots, parsnips, tomatoes, beets and turnips (Nevada Surveyor General 1880:34-35).

Animal wants no less than human needs were supplied by early farmers, who raised hay, barley and oats to feed thousands of horses and mules brought to the region by the mining industry, freighting companies and the general populace. Reese River and Grass Valley produced hay for the Austin area (Reese River Reveille, 16 May 1863:2; 5 April 1864:2) and Nye county mining communities were similarly supplied from nearby ranches (Nevada Surveyor General 1866: 63; 1892:112). At first, hay was derived principally from native grasses that grew in valley meadows; alfalfa was not raised in quantity until the 1880's (Short 1965:42).

Because production of garden crops was geared almost entirely to local markets, this form of agriculture gradually declined during the 1880's, as the region's first mining boom

came to an end (Hardman and Mason 1949:24). There appears to have been little attempt to grow vegetables for more distant markets. This was probably due to lack of sufficient water to grow these crops on a large scale, and certainly to the high cost of transportation to markets outside the immediate area. Instead, many farmers and small ranchers turned to the range livestock industry, which had been developing in the region since the early 1860's.

Historians have credited emigrants travelling to California in the 1850's with bringing the first livestock into Nevada (Hardman and Mason 1949:23; Short 1965:4; Hazeltine 1961:1-2). At "stations" set up along the Humboldt and Carson routes, travelers were able to exchange exhausted animals for others, left behind by earlier emigrants, which had "recuperated" in nearby valley meadows (Hardman and Mason 1949:23; Georgetta 1965:28-29). Herds thus built up by settlers along the emigrant routes remained small, however, because there were no local markets in central Nevada to encourage greater development (Townley 1976:111).

The 1860's brought significant changes to the region's fledgling livestock industry. Drought and a severe winter in California in 1862-63, coupled with discovery of silver at Reese River and its attendant boom, brought California ranchers to the Humboldt valley, where prime grasslands offered excellent winter grazing (Townley 1976:111). Occupation of rangeland here and in valleys to the north and south was further encouraged by news in 1866 that the Central Pacific Railroad would be routed along the Humboldt, thus providing central Nevada ranchers with a direct shipping line to California markets (Townley 1976:111). The railroad also lured Texas cattlemen, who brought longhorns into Nevada until 1869, when local concern over importation of disease along with the cattle resulted in state legislation that ended Texas drives (Townley 1976:113).

Although large-scale ranching, dominated by California cattlemen, first developed in the Humboldt region, explosion of mining activity throughout central Nevada created many new markets for both sheepmen and cattle ranchers. Like cattle, the first significant numbers of sheep were brought from California, beginning soon after the Civil War, in response to a growing demand for mutton in mining camps (Georgetta 1965:25-26; Connor 1918:135). Soon, however, sheep, as well as cattle, grazed in many central Nevada valleys, and ranches could be found "wherever a large enough stream [came] down from the mountains" (Berg 1942:57). In many cases, individual stockmen owned (or claimed) several ranches, all in one valley or scattered about several, thus

ensuring adequate water and grazing for their growing herds (Truett Papers).

Rapid increase in livestock numbers, however, pressed the region's natural resources to the limit. In the 1870's, a period of significant growth in the livestock industry, overgrazing became a noticeable problem (Hardman and Mason 1949:23; Sawyer 1971:17; Short 1965:20) as cattlemen vied with each other and with sheepmen for access to water and grass. Against sheep, cattlemen were at some disadvantage. The woolly animals, "following the grass" (Fleming and Brennen 1937:4), travelled much farther for forage, from spring and summer grazing in the mountains to desert winter ranges in the south, which were often far from their home ranches (Clawson 1950:228-29; Fleming and Brennen 1937,3). Sheep ate snow, thus allowing more flexibility in the location of their winter ranges, since for at least that part of the year they would not be dependent upon springs or streams for water (Fleming and Brennen 1937:3).

It required only a severe winter or two to confirm the somewhat precarious nature of the region's livestock industry. The first such winter, in 1879-80, produced losses of up to 50% in much of central Nevada (Short 1965:28), as depleted rangelands simply failed to provide sufficient browse to meet livestock needs. In response, ranchers in the 1880's began to consider growing alfalfa as a way to supplement hay supplies heretofore drawn principally from the natural grasses of valley meadows (Short 1965:45). During the winter of 1889-90, livestock losses ran 40% statewide. Subsequently, winter feeding, previously the exception, became much more the rule (Short 1965:66).

The turn of the century was a time of adjustment in the region's livestock industry. Until then, ranchers had gone their own ways, dealing with individual problems of food and water in a spirit of "fair play" (Truett Papers). The winter of 1889-90 however, pointed out the need for systematic management of the range, rather than simple exploitation of it (Short 1965:66). Rapid expansion of the sheep industry in these years also provided cattlemen with added incentive to seek some form of range management. For 20 years, the sheep industry had been dominated by Scandinavian, Irish and Scots immigrants. In the 1890's their numbers were noticeably increased by the Basques, many driven out of California by drought, joining countrymen who had come early to Nevada from Oregon (Short 1965:77; Barrenchea 1961:1). These newly-arrived Basques contributed in a major way to growth of the sheep industry, which reached a peak statewide by 1910 (Hardman and Mason, 1949:23). Although they concentrated for the most part in northern and northeastern Nevada,

Basques soon could be found on ranches scattered throughout the study area, particularly in the north and central mountain sections. Some established ranches in hitherto unexploited locations, but others simply acquired existing operations, converted them if necessary to sheep raising, and made other improvements as needed. Two examples are Moore's and Pritchard's stations in Hot Creek valley, which in the early decades of the 20th century were home to Baptiste Sorhouet and Phillipe Egoscue, respectively.

Pressure of sheep against the dominant, but struggling, cattle industry led to attempts to control the former through grazing laws, and sheepmen were required to obtain livestock certificates from county officials in the course of moving their herds through the seasonal grazing cycle (Truett Papers; Creel 1964:11; Nye Co. Records: Livestock Certificates 1916-1918). Additional regulation came with establishment in 1906-07 of several National Forests in the region, in which livestock (generally sheep, which foraged in mountainous areas where cattle could not) could graze only for a fee (Creel 1964:12).

Cattlemen also faced competition from another quarter, one less amenable to regulation. Toward the end of the 19th century, valleys of the Great Basin became a sort of last refuge for thousands of wild horses, descendants of stray stock from the region's mining camps and ranches. To cattlemen, mustangs were useless as work animals, and their numbers and foraging patterns depleted available rangeland as severely as did sheep (Thomas 1979:36; Wyman 1945:97; Hardy, in Venstrom and Mason 1944:610). The increase in mustang herds, due to depressed prices for horses that obtained from the 1870's until well into the 1890's (Thomas 1979:38) evoked sufficient outcry to pass legislation in 1897 permitting the destruction of "unbranded, wild" horses (Venstrom and Mason 1944:40). Within a few years, over 15,000 horses were shot, but hunters' enthusiasm for almost anything equine, regardless of ownership status, led to the law's repeal (Wyman 1945:139).

International events, beginning with the Spanish-American and Boer wars, created a strong market for horses, wild or otherwise, and mustangers became frequent visitors to central Nevada's valleys. Despite their efforts, nearly 100,000 mustangs could be found in the region as late as 1910 (Wyman 1945:121, 138). World War I provided another enormous market for horses, and ranchers and mustangers alike vigorously supplied the demand (Wyman 1945:142; Thomas 1979: 39). War's end, however, brought the inevitable decline in prices, and remaining horse herds grew once again. Their

numbers, coupled with continuing lack of federal regulation over grazing of cattle and sheep on public land, led to serious--and in some areas of the west, still evident--depletion of existing rangelands (Thomas 1979:39). Finally, Congress passed the Taylor Grazing Act in 1934, which among other things provided for direct government participation in wild horse control. These efforts were assisted by development of the dog and cat food industry after World War II, which created a long-term market for horse meat.

Although individual wild horses were captured by various means, including creasing, snaring and roping, the most popular method was to drive horses in bunches into enclosures (Wyman 1945:224). The circular corral or "trap," which was entered via a "funnel" formed by two wings, was of Spanish origin (Wyman 1945:216), and its simple and efficient form endured, whatever the materials employed. The "funnel" concentrated the running horses into a compact mass headed straight for the enclosure, and the circular form of the corral eliminated corners in which the animals might otherwise have been crushed and injured (Dobie 1934:227). Brushy hollows and canyons were "usual locations" for horsetraps, but they could also be set up at a water hole or spring, or on the bank of a creek at a crossing commonly used by wild horses (Dobie 1934:229; Wyman 1945:239).

Horsetraps, seldom designed for permanence, were often constructed of materials readily at hand, such as cottonwood and juniper posts, brush, whole trees or logs, the whole often tied together with woven wire. Stone may have also been used, because there was so much of it available, but the effort required to pile it up probably made employment of this material unusual, or practical only in circumstances in which the corral was intended for other uses as well. An alternative, developed by mustanger "Pete" Barnum and first used around WWI in the "wildest parts of Nevada" was the canvas corral (Wyman 1945:221, 222). It was easier to transport than wire, and was far less injurious to horses.

Although built as temporary structures, wild horse traps are still to be found in the study area. Because the wild horse problem was, and is, a recurring phenomenon, and because traps were constructed over the years with a limited variety of materials, it is not always easy to date them. Only a few traps have been recorded in the study area. None of them is of canvas, a material which "revolutionized the methods" of Nevada horse-catching (Wyman 1945:221), but this is hardly surprising since a basic feature of the canvas corral was its portability. However, recorded traps include examples of log (891), post and cable (850), post and barbed

wire (961) and even log and sheet metal (1229) construction. One, at Rocky Gap Spring (1192), also includes remains of additional activities associated with horsecatching, such as sorting or breaking, although the structures are in a very deteriorated condition. One horse trap (130) has been listed in the National Register, and cited for its resemblance to a trap described by Will James. More to the point would be study of the variety of forms, materials and utilization of natural features that characterize horsetrap construction and location, and recognition of these structures as integral components of the region's agricultural history.

Irrigation, fencing and breeding were other ways in which central Nevada ranchers of the late 19th and early 20th centuries attempted to deal with environmental constraints and competition for both markets and grazing lands. As 19th century township survey maps clearly show, farmers and ranchers began irrigating portions of their land at a very early date. These irrigation systems, which could range from shallow ditches that carried water diverted from streams by small brush dams, to "great masonry walls" (Smythe 1905:334), were probably used often in the early decades to water garden crops and barley sold in mining camps and towns. Gradually, however, irrigated lands in the region came to consist largely of native and improved grasslands producing hay or pasture for cattle, and were also used to control natural sources of drinking water (Adams 1926:331; Hardman and Mason 1949:26). Two existing systems may be seen on ranches of some age: the O'Toole Ranch (1236) in upper Reese River valley, and San Antonio Ranch (944) in Big Smoky valley.

Barbed-wire fencing, which came into use in the 1880's (Crofut 1970:89), served a variety of purposes. In the competition for water and range, barbed wire was erected to protect pastures, springs and other watering places from both wild horses and other men's livestock. Fencing of pastures, however, sometimes cut animals off from water; the result was an increase in drilling of wells and erection of tanks and windmills in pastures distant from existing water supplies (Shannon 1945:206).

Fencing was also a factor in the improvement of breeding stock: without it, a rancher's fine bull or stallion would give free service to his neighbor's herd, and his blooded mares or cows would be subject to unwanted attention from wild or less valuable visitors (Venstrom and Mason 1944:610). Although agricultural statistics from 1890 indicate that very few ranchers in the study area were running blooded stock, the need for hardy animals that produced the quality and quantity of meat expected by American consumers led to serious attempts to improve herds. A notable example was

the Lander County Livestock Co., organized in 1905-06 by George Watt and J. A. Milboy, on Watt's father's Silver Creek Ranch (2118) in Reese River valley. The company's emphasis was on improvement of local breeding stock, and to this end Watt and Milboy used investments from area ranchers to acquire Herefords from the Reno area and Cotswold rams from Utah; among horses, their "principal attention" was devoted to draft animals (Reese River Reveille, Spec. Supp. Jan. 1910:80-81).

Although the fragile nature of the environment had begun to constrain central Nevada's livestock industry barely a decade after ranchers moved into the region, many more decades were to pass before a reasonably workable form of range management was developed. The early decades of the 20th century saw experimentation in several directions, such as county-issued livestock certificates (generally for sheep) and establishment of national forests wherein grazing was federally regulated. One effort at the state level was the 1903 Irrigation Law, which created the Office of State Engineer, one of whose responsibilities was regulation of the appropriation of water from the state's rivers, springs and streams (Report of State Engineer 1903/04). A major problem, however, was the federal government's policy toward public lands. Historically, that policy had been geared to speedy distribution of land to individuals, in order to give men of little wealth an opportunity to pursue Thomas Jefferson's agrarian dream. Federal land laws were aimed at disposal, which succeeded mightily in the prairie and plains states, but failed in the mountain and desert regions of the far west. Thus in central Nevada, land ownership was not characterized by a Jeffersonian profusion of small holdings, but rather by a small number of ranchers claiming only water and pasture-lands, leaving marginal ranges (which comprised most of the region) in the public domain. The result was, of course, overgrazing, depletion of water sources, and competition--political, legal and physical--among the region's ranchers (Clawson 1950:95-96; Adams 1916:324-325).

The Taylor Grazing Act of 1934 finally confronted the question of management of public lands. Most important for the range livestock industry was organization of grazing districts, mostly below national forests, that included desert and semi-desert range; and the creation of the Bureau of Land Management out of the Grazing Service and General Land Office in 1946 (Clawson 1950:100). Grazing permits controlled the numbers of livestock on public lands, and seasonal movements of sheep were regulated through establishment of formal "trails" (Sawyer 1971:89). Concern for maintenance of the range also brought the BLM into the question of wild horse control, which proved a boon for

ranchers but a source of controversy elsewhere (Thomas 1979).

The Taylor Grazing Act and subsequent articulation of federal land policy provided central Nevada (and the west as a whole) with a much-needed framework for range conservation and use. The federal "partnership" with ranchers has not always run smoothly, due to differing opinions on matters such as proper rate of stocking, multiple use of public land, and how much regulation is "enough." Nonetheless, careful management of the environment has sustained to this day one of the most important elements in the historical and economic development of the region.

Ranchers and Ranches

A major consequence of discovery of silver at Reese River was the opening of the entire central Nevada region to agricultural as well as mineral exploitation. Even as prospectors scattered throughout the mountains, the broad valleys and foothills were host to prospectors of a different sort, seeking water and grasslands on which to establish farms and ranches. Logically enough, many of the earliest ranchers located near Reese River; as noted previously, a "goodly number" were settled in Reese River valley and ready to cut hay by the spring of 1863. At the same time, ranches were established in Grass Valley northeast of Austin, among them Dan Callaghan's (2119) (Reese River Reveille 12 Aug. 1863:3). To the west, the brothers Maestretti located sheep ranches on Smith Creek, by the former Pony Express station (476) (Truett Papers; King 1954:51), and Peter and Frank Peterson established ranching and small-scale mining operations at the north end of Smith Creek Valley (473) (Kusunoki 1961:8).

Situated often in the foothills of the ranges, hard by streams flowing down from the mountains, or in the wider canyons, ranches were founded in the 1860's and 1870's throughout central Nevada. Lee Vaughn and George Watt (2118) settled in lower Reese River. Diamond Valley ranches included the Sadler (2150) and Romano (2146). H. C. Fenstermaker (1039,2130) located in Fish Creek Valley, where in 1879 he developed a fish hatchery in artificial ponds near his ranch (Nevada Surveyor General 1880:30). Other early ranches in this eastern portion of the study area were Nichols (k/a Hay Ranch) in Kobeh Valley (2135) and, near Secret Canyon, Nager's ranch (k/a Bank Ranch) (1016).

The broad Big Smoky and Monitor valleys, reaching south far into Nye County, were also occupied early, at least partly in response to mining activity that focused on the surrounding mountains in the 1860's and 1870's. Givens' ranch (2115), at the north end of the Big Smoky, was occupied by the mid-1870's, as were Black Bird ranch (2108) near the site of the Cape Horn Overland station (2109) and Henry Schmidlein's ranch at the mouth of Kingston Canyon. Farther south, one of the earliest ranches was Darrough's (354), with a house built in 1863 that is still extant. In Monitor Valley, early cattle ranches included Joseph Hodges' Box Spring (2131) and Samuel Steininger's on Mosquito Creek (2194). Another was "Anderson's Empire Ranch" an 1870's cattle operation converted in the 1890's to sheep by William Potts (Berg 1942:59; Truett Papers).

Farther east and south, Little Fish Lake Valley was host to Miller's Crow Creek Ranch (340) by 1876. At the south end of this valley, J. D. Page, proprietor of Hot Creek's "butchering gallows," established a ranch, perhaps as early as 1865 (Lewis 1970:42). Stone Cabin valley also saw early agricultural settlement: in 1875, Daniel Murphy was running cattle at Stone Cabin ranch (2167), earlier known as the Fitzpatrick ranch. The Twin Springs Stock ranch (2168), at the south end of Hot Creek valley, was owned by Jewett Adams, one of the state's major stockmen who served as Lt. Governor and Governor in the late 1870's and through most of the 1880's. Adams' political activities did not prevent him from taking an active interest in his ranch holdings. In September 1877 the Tybo Sun announced Adams' arrival in town and his plans to "look after stock on his ranch near Twin Springs" (22 Sept. 1877:1). By 1880 the ranch employed twenty-five hands who "being cow boys they were absent from home" when the federal census enumerator came to call that year.

While most ranches were developed simply for farming and stock growing, others were associated with stage or freight stations at some period in their history. Some ranches developed at existing stations; others may have preceded, and later incorporated station functions, and some may have served the dual purpose from the beginning. Regardless of chronology, however, ranches of this type had in common their location along major transportation routes, or at the junction of several roads, as well as proximity to water and grazing necessary for both station and ranching operations.

Although the Pony Express was short lived, a number of its hastily-built stations had a much longer subsequent history as ranches (Welch 1979:30). Among these was Dry Creek (2116), which John Hickison developed into a substantial sheep enterprise by WWI, with a dwelling, barn, shop and bunkhouse (Nye Co. Records, Livestock Certificates). Smith Creek station (476) was acquired by Antonio Maestretti and his brother in the 1870's. Roberts Creek (2139) and Grubbs Well (2137) stations are today the site of working ranches (Welch 1979:50). Diamond Springs (2151), also with current ranching activity, was by 1879 home of W. F. Cox and a telegraph station, and at the same time Sulphur Springs was occupied by a man named Barnes.

The station/ranch phenomenon was not limited to former Pony Express/Overland stops. Along the Eureka-Hot Creek-Tybo routes developed in the late 1860's and early 1870's, Summit (2195) station was by 1889 claimed by John Williams for stock cattle (Truett Papers), and, as noted previously, C. W. Hicks and the Moore brothers managed stations and stock operations

simultaneously (1880 Federal Census, Nye Co.; Truett Papers). In Monitor Valley, there is evidence that Smith's station (2184) was by 1880 site of a ranch operated by Michael Corcoran (1880 Federal Census, Nye Co.). At the same time, stationkeeper Thomas Morgan (1044) had a small herd of cattle to tend as well as travelers and teamsters to care for (1880 Federal Census, Nye Co.; Truett Papers).

A few ranches grew up at centers of mining activity, usually after the mines had closed and the miners had, often quite literally, "folded their tents" and moved away. Two good examples are Hot Creek and Upper Hot Creek ranches (324), which were developed in the early 20th century amid the ruins of twin mining camps of the same names. In Little Mill Creek Canyon on the eastern slope of the Kawich range, discovery of gold and silver in 1905 led to formation of a camp known variously as Gold Belt or Eden. Two ranches, Eden Creek and Upper Eden Creek (337) subsequently occupied the site and structures of this short-lived mining venture (Blume 1977:II-129-132).

As noted in this study and elsewhere (Shepperson 1970), 19th century mining camps and towns of central Nevada featured a decidedly international cast of characters. Although less pronounced, and certainly less recognized, that "cosmopolitanism" was also present in the region's agricultural society.

The most frequently mentioned national group was the Basque, which contributed significantly to expansion of the region's sheep industry in the late 19th and early 20th centuries. Other nationalities, however, also participated in the settlement and agricultural development of the region. Irish were represented by farmers and ranchers such as Dan Callaghan in Grass Valley, William Smythe near Hot Creek and Michael Corcoran in Monitor Valley. William Potts, a Monitor valley sheepman, came from England. The Germans included dairyman F. Gelleman in the northern Reese River Valley, Daniel and George Ernst in Hot Creek, Leopold Steiner near Austin, and Charles Goldbach, a sheep dealer from the Belmont area. Swiss and Italians, despite their overwhelming identification with the charcoal industry, also included agriculturalists among their numbers, particularly after the charcoal demand of the 1870's and 1880's declined. Thus farms and ranches owned by Swiss and Italian immigrants are found throughout the region: the Maestrettis at Smith Creek, De Paoli, Mattei, Pedrioli and Romano in Diamond Valley, Maggini in northern Monitor valley, Walti in Grass Valley, Bordoli and Arigoni at Ox Spring on the east side of Railroad Valley.

The central Nevada ranch, regardless of location, age, type of livestock or ethnic origins of its operator, basically consisted of one or more houses and an assortment of barns, sheds, corrals and miscellaneous outbuildings. If the operation were large, there might be a bunkhouse and perhaps a dining area for hired hands. Very large barns were uncommon, as it was generally the practice to winter stock outdoors, even if they were hand-fed (Crofut 1970:89; Carpenter 1941:41-3). For young and weak animals, an open shed across one side of a corral was considered sufficient bad-weather shelter. On ranches that served also as freight or stage stations, a stable or barn might be available for weary teams, and many ranchers built small barns for dairy cattle or for particularly valuable cattle or sheep. Given the arid climate, there was little need for hay storage, even in the open sided hay barns common in states to the north and east. Instead, hay was brought from the field by wagon and piled into large, rounded stacks, accomplished through use of a wooden, generally portable, derrick (Fife 1948:225-239). There was often a "hay corral" within the ranch complex proper, but hay could also be stacked in outlying pastures or brought to livestock on the range in wagons or sleds (Crofut 1970:89, 93).

Other ranch structures included sheds for storing haying machinery, wagons and other equipment, and perhaps a forge or smithy. Unlike crop farms, which in the 20th century became heavily mechanized, there were few opportunities for mechanizing a livestock operation, so the number of machine sheds on ranches tended to remain small. Also seldom seen were corncribs or silos, since central Nevada's most viable crop was hay, rather than corn.

The ranch also provided food and shelter for the rancher, his family and his hands. The ranch house was commonly a low, one-story rectangular structure, with shallow gable roof, entrance in one of the long sides, and seldom more than three or four rooms (Trewartha 1948:179, 182). A garden provided fresh vegetables in season, some of which might be stored in cellars dug into the ground. Chicken houses and perhaps an occasional hog house provided additional sources of meat, which could be cured in a small stone smokehouse.

Although most ranches had less than 10 functional buildings (Trewartha 1948:179), it is not uncommon to encounter ranches with many more. As a rule, a large number of buildings, many in various stages of decrepitude and disuse, reflects a long history of occupation on a ranch, in which, due to plenty of space, new structures were erected as needed and the older buildings gradually abandoned.

The materials of ranch construction were many, and although quite varied had in common their ready accessibility and low cost. In a region of long distances and fairly primitive transportation, the cost of manufactured building materials, such as milled lumber and brick, tended to be prohibitive, and much of the best lumber, when available, generally went into the mines. Barbed wire, too, was expensive at first; and when used was often to enclose large areas of ground such as pasture, while cottonwood or juniper stakes of random length, set close together as a "palisade," were commonly used for the ranchstead's corrals and pens. Another fence type featured rails or saplings notched into vertical posts.

Until well into the 20th century, ranch building construction was almost exclusively a function of the kind of materials locally available: cottonwood, juniper, willow, adobe and stone. These materials were seldom worked by accomplished carpenters or masons; rather they were "finished" only to the extent absolutely necessary, and then assembled with great dispatch. The result was a group of buildings "not of very ostentatious or even comfortable pretensions"--at least at first (Reese River Reveille 30 April 1864:3). The functional invariably won out over the aesthetic, and scavenged materials, such as corrugated metal, railroad ties and even flattened metal cans eventually appeared on ranch structures. As long as it served the purpose, any material was useful: ranchers' priorities for investment lay in land and livestock rather than buildings (Clawson 1950: 200).

Ranch structures, regardless of use, tended to have a low, long rectangular shape, with a shallow-pitched shed or gable roof. Dwellings and animal sheds generally had entrances in the long side, while other structures such as barns or machine sheds often had doors on a gable end. Although wall materials tended to be rough, door and window openings were often framed with more carefully cut, or even milled lumber. Dirt roofs were extremely common (Blume 1977: I-40), as most available wood was unsuitable for shingles, and manufactured shingles, like so many other things, were scarce and expensive in 19th and early 20th century central Nevada. Furthermore, the dry climate meant that shingles, whose main purpose is to shed water, were not really necessary. The dirt roof, on the other hand, was certainly economical, and easy to construct:

> "The truss system usually employs trimmed tree trunks or large limbs, the rafters being made of limbs smaller than the ridgepole or headers. The system is then nailed or tied together. When the rafter system has

> been connected to the ridgepole and headers and the joist system is in place, branches are spread over the rafters and secured at the ridgepole. These are then covered with canvas, burlap, pieces of metal, grass, shredded bark, paper products or other kinds of flat materials. A layer of dirt, usually between 4 and 12 inches thick, is placed over the whole . . ." (Blume 1977:I-40).

Stone construction was utilized throughout the study area, again principally due to availability of the material. Perhaps more precisely termed "rubble rock" construction, this method employed undressed stone laid up dry or with a mud or lean concrete mortar. If the rocks were extremely irregular, the resulting wide joints might be filled with small stones and then mortared, in a simple form of galletting (Blume 1977:I-41).

Although the arch is a traditional way of bridging openings in masonry, it appears to have been seldom used outside of towns. Instead, door and window lintels were made with wood slabs, square timbers or, much more rarely, stone. One of the few exceptions so far recorded in the study area is the dwelling at Stone House Ranch in Monitor Valley. This house is unusual for several reasons: it has two full stories, and the front wall is constructed of carefully dressed random ashlar. On this elevation, too, first-floor openings are surmounted by shallow segmental arches of brick. Bricks were easier to work with than stone, which probably accounts for their use here. One reason for the use of arches at all may have been to distribute the weight of the masonry above: in the more common single-story building, the amount of stone above door and window openings was generally small enough to eliminate the need for arches entirely.

There is a great variety of stone construction to be found in the study area. Minimun's Station (1004) near Bowman Creek features a small rubble-rock dwelling, with shallow dirt roof and stone slab lintels. On Potts' Ranch (1010) is a small barn or machine shed constructed of rather large rocks that may have been very slightly dressed to give a roughly rectangular shape. The shingled roof is steeply-pitched, by area standards, and the gable end above the wide entrance is sheathed with rough clapboards. At Butler's (1034) is a long, rectangular stone house with a substantial exterior chimney and the ubiquitous dirt roof. Several stone buildings are found on the Segura Ranch (1038). One, a small barn or animal shelter, has thick mortar joints in its rubble walls, and a wide "dutch" door in the gable end. Perhaps due to the width of the structure, the roof system

includes two log purlins, as well as log ridgepole and plates.

The dugout (many examples of which are found in mining, rather than ranching, areas, perhaps because many originated as prospects) also employed stone in its construction. Excavated into the slope of a hill, the dugout was a relatively simple structure, although it could be quite substantially built. A good example may be found at Cloverdale Ranch (352), which has a variety of interesting and well-preserved structures. Another rather crude dugout is at Spanish Spring (364), 20 feet square and constructed of small boulders.

Several stone ranch houses, which appear to date from around the First World War, show slightly more attention to "style" than is generally the case with ranch houses recorded in the study area. The houses at Moore's and Pritchard's stations have clearly quoined corners, which not only provide a decorative touch but contribute to the strength of the walls. At Hot Creek Ranch (324), the main house (c. 1910) is constructed of well-cut stone, and has a simple wood cornice, porches with short columns on pedestals, and a high conical roof projection at one corner.

Buildings of fired brick are seldom found on central Nevada ranches, although a brick house from the 1880's has been recorded at Twin Rivers Ranch (2211) in Big Smoky Valley (Truett Papers). Adobe brick, an ancient tradition in the southwestern U.S., was sometimes used where there was a convenient water source (Blume 1977:I-39). One of the earliest dated examples in the study area is the ruin of the stage station at San Antonio (356), which combines firebrick and adobe, and was once washed with an adobe plaster on the inside (Blume 1977:II-24-25). Potts Ranch and Morrison Ranch (1029) each have several adobe structures; loss of a roof on one at Morrison's vividly illustrates the effect of weathering on the material, which seems to "melt" in the rain. A far better preserved (and certainly more recent) adobe house is at Upper Hot Creek Ranch. Its neat bricks are cemented with mud, the windows have manufactured sash, and the whole is covered with a shallow hipped roof.

Mud-wall construction was also employed in central Nevada (R. L. McGonagle, personal communication). Like adobe brick, mud-wall construction was practiced by native populations of the southwestern U.S. Also known as puddling, the method involved erection of walls in place, with layers of moistened clay set in forms, each layer dried before the next was added--a technique similar to some methods of pouring concrete today (Foley 1980:88). A good

example is site 1005, where the one-story ranch house still retains impressions of wooden forms used in building up the walls.

Wood construction involved either framing or mass walling. Mass walling probably occurred earlier in the historical development of the study area, due to shortage of milled lumber for framing and the greater local availability of sizable timbers in the first decades of settlement. Best known is the "log cabin" form of timber walling in which logs, simply peeled or sometimes roughly squared, were laid horizontally, notched together at the corners and sometimes chinked with mud. Good examples include Dry Lake Cabin (1032) and buildings at site 1033 in Little Smoky Valley. Another is a well-preserved barn on the old Page Ranch in Hot Creek Canyon (2177), built with horizontally-laid logs of 9"-11" diameter. Log roof trusses are given additional support on the exterior by vertical wood posts that function as pilasters or buttresses. A variation on this theme is the small building near a well in Little Smoky Valley (1040). The long side walls are laid horizontally, and are held in place by a vertical post at each end, while the gable end walls are of vertical plank construction.

The size of log structures was to some extent limited by the length of timber available, and local builders exercised varying degrees of ingenuity in this regard. The problem could be solved in several ways, one of which was "modular" construction of cribs or pens side by side. Another was use of corner posts, or posts at intervals along a wall, into which horizontal members could be notched or pegged. Finding timbers of sufficient length for ridgepoles and purlins could also be a problem; it could be solved by using trusses instead, without a ridgepole, or by constructing a ridgepole from short lengths and supporting them on posts.

It is also appropriate to mention here that railroad ties were also used in mass-wall construction. Examples recorded in the study area to date include 20-mile Shack (1051) and structures on the Ferguson Ranch (2136).

Vertical timber mass walling in the U.S. is generally associated with the French occupation of Canada and the Great Lakes-Mississippi regions. In the Antelope Range of central Nevada, however, "Parker's" place (1042) has a most interesting example of this technique. The walls of the little house are built of totally unworked log posts set directly into the ground (technically known as poteaux-en-terre construction). Voids between each pair of posts are filled with lengths of sapling, and the chinks are daubed

with mud. The nearly-flat roof has a covering of dirt over closely-set pole rafters, and long, slender poles along the roof edges keep the dirt in place.

Although no specific examples appear in the available site data, vertical plank walling should be mentioned here, as instances undoubtedly can be found in the study area (Blume 1977:I-46). Posts and studs are not used in this construction; rather, the walls might be built something like a gate or door, with boards placed vertically on one or more cross members, and the walls then simply nailed to the flooring system and together at the corners. This is a very weak structural system, but a ranch house of this construction in southwestern Idaho has been dated to c. 1860 (Dennett, Muessig & Associates 1979).

Whereas in mass walling the weight of the roof is carried by the walls, in timber or box frame construction the weight is distributed to a small number of vertical elements, generally corner posts. The most common variation of this form is the balloon frame, developed in the mid-19th century, in which a series of closely-spaced studs along the walls replaces the need for heavy corner support. In 19th century central Nevada, it is possible that wood frame structures were more common in mining, rather than ranching, areas (Blume 1977:I-39). However common, their lumber was valuable, as the many instances in which wood frame structures were moved from one camp to another clearly attest.

Wood frame buildings did occur on ranches, however, particularly in the later 19th and 20th centuries when improved transportation had rendered milled lumber more available. Their most notable characteristic is the variety of materials used as exterior sheathing. Corrugated sheet metal is found at Spencer Hot Springs (1003), Bartine Ranch (1015), Ardan's Well (1041), Stone Cabin (2167) and the Peavine Ranches (2174, 2175), out of many possible examples. Although not associated with a ranch, the two structures at Baxter Spring (363) are worth mentioning because their walls are faced with flattened metal cans lapped over one another like large shingles. Vertical board siding, with or without battens, is found on many ranches, such as Stone Cabin, Dugan (2178) and Bellehelen (2160) ranches. Horizontal wood siding seems to appear principally on dwellings, rather than outbuildings, and is generally wide plank or shiplap, rather than clapboarding. Houses utilizing this form of siding include dwellings on the Potts (1010), Dugan and Peavine ranches, and on an abandoned ranch on the east side of Diamond Valley (1035).

Wattle and daub construction is also found on central Nevada ranches:

> "In wattle-and-daub construction, a wooden framework--usually made of willow because this tree is readily available and grows quite straight--is built and then filled with rocks and mortar. Mud is applied to both surfaces of the finished wall. . . . Log posts, placed vertically in the ground . . . act as studs for the framework. For a structure the size of a house, these vary in diameter between 2 and 8 inches . . . (the size of the structure is usually dictated by the size of the wood available for the framework). Sticks from 1 to 3 inches in diameter are then fastened (usually with nails) to the posts, horizontally from the ground up, to form an exterior and an interior wall. . . . The void created between these walls is then filled with a mixture of mud and rock material. . . . The finished wattle wall is daubed with mud . . . (Blume 1977: I-43-44).

Kensler (Blume 1977:I-43-4) seems to link wattle and daub construction to earlier Paiute and Shoshone reed and twig huts (p. 19). A group of houses built with wattle and daub on the Peavine Ranch is reported to be of historic Paiute origin (Blume 1977:II-28), but this method of construction is also found on other ranches, at which no particular instance of historic native occupation has to date been documented. An abandoned ranch in Big Smoky Valley (1005) has an animal shed of wattle and daub, and Wilkins' Ranch (1006), to the west, features a low, broad-roofed barn and small dwelling built in this manner. The roof of the little house is interesting in that it is edged all around with a shallow plank "frame," probably added to prevent elements of dirt roof from rolling or washing off.

Finally, at Monitor Ranch (1036), a long rectangular animal shed displays an unusual variation of wattle and daub construction. The walls are laid up with quite long, straight peeled saplings that appear to be laced together roughly on the log cabin principal, but this lacing occurs at intervals along the wall plane rather than at the corners, creating "panels" that permit a structure of rather long dimension. On the exterior, at least, the walls do not appear to have been daubed at all, and it is possible that the sapling wall alone provided sufficient shelter for the rancher's livestock.

Despite the present lack of detailed, site-specific information, it is clear that the ranches of central Nevada have much to reveal about the historical and environmental

circumstances of the region's agricultural settlement and subsequent development. The physical characteristics of ranches--number, form, type and arrangement of buildings and structures, the materials and methods of construction--can tell a great deal about how people and their livestock lived, both in relationship to each other and to their natural surroundings. The collective history of the ranches, whether abandoned or still active operations, gives sharp focus to the interconnectedness of human activities in the region. Ranchers and their families were significant participants in the settlement of central Nevada. Their garden crops and meat contributed a pleasant and nutritious variety to the diets of towns and mining camps. Their houses and stables provided respite for weary travelers and teams along crucial arteries of transportation and commerce. Raising of sheep and cattle contributed substantially to the importance of the livestock industry in the state. And, in a larger context, ranchers' efforts to use, and yet conserve, the land and its fragile plant and water resources contributed to the development of new public policy regarding the western--and central Nevada--range.

Town and Valley: Expressions of Community

The fortunes of central Nevada mining camps and towns were extremely varied, although all began with the premise that ore rich enough to make everyone wealthy was immediately, or soon to be, at hand. As a rule this turned out to be seldom the case, or for only very short periods of time, and the legacy of many camps is today only a handful of adits and a remembered name. The quality of the ephemeral was a hallmark of the region's mining settlements, well-documented as early as 1881 by Myron Angel in his massive History of Nevada. Angel's thumbnail descriptions, as well as those offered by other contemporary writers and more recent chroniclers, provide brief, vivid views of many of the region's early mining communities.

Writing from Reese River in 1866, J. Ross Browne characterized Clifton as "a broad street flanked by the wrecks of many frame shanties," having "died about two years ago" when its populace moved up the canyon to Austin (Browne 1866:27). About the latter town, he had more to say, noting frame buildings "well constructed, and ornamented . . . by rows of scrubby pines stuck in the ground" (Browne 1866:36). He described "the best private residences . . . substantially built of stone," and "many fine brick houses" (Browne 1866: 36). In stark contrast was Canyon City, further up the Reese River Valley on Big Creek, which "two years ago" had a post office, stores, saloons, and a telegraph line but was in 1866 "a long street of empty houses" (Browne 1866:41). By 1881, the "houses, including the cabins" had "departed" (Angel 1881:472).

Angel, writing less than 20 years after the first mines opened at Reese River, noted that at Jacobsville, first Lander County seat, there was "nothing left but a single farmhouse" (Angel 1881:473). Another ephemeral town was Geneva, once site of "some fine stone buildings and numerous log and cloth houses" of which little remained in 1881 (Angel 1881:473). Bunker Hill, on Big Smoky Creek, had from 1863 to 1865 been a "thriving place," but soon the town was "but a collection of miners' cabins" (Angel 1881:472). Another brief venture was Amador, seven miles north of Austin, about which Angel said "the town was built chiefly of cloth, and has gradually disappeared" (Angel 1881:472).

Whereas Lander City, which had several hundred inhabitants in 1863, was by 1881 "known only in name" (Angel 1881: 473), Belmont, the Nye County seat, was more fortunate. Although mining production varied from year to year, the town was able to rise beyond the camp stage to boast houses and commercial blocks of stone, brick, adobe and wood, and

sidewalks "of wood and stone" (Angel 1881:519-520). Ione, on the other hand, suffered from loss of county seat status, and by 1881 contained two idle quartz mills and 25 people housed in "chiefly frame structures" (Angel 1881:525).

The character of mining camps altered little between the first boom period (1860-80) and the second (1900-10). Although the latter boom resulted in resumption of mining in many portions of the study area, much early 20th century activity occurred in Nye County at prospects old and new, among them Pine Tree Camp near Manhattan, Baxter Springs, Pueblo and Millett in Big Smoky Valley (Berg 1942:162; Ingalls n.d.:1). Manhattan itself first grew under canvas, but frame buildings, and eventually solid brick and stone structures, soon gave the town an air of permanence (Berg 1942:100), as happened also at Round Mountain, and at Tonopah on a much larger scale. Aside from these towns, however, the short-lived camp remained the rule, an often disorderly jumble of tents, shacks, stone dugouts, crude masonry buildings and frame structures, the latter not infrequently moved in from other camps. These transitory population centers included Atwood, full of "tents and houses" (Tonopah Bonanza 2 May 1903:7), Ellendale, Jett (which consisted of "several cabins and a boarding house" (Berg 1942:46)), Golden Arrow, Monarch, Silverbow and Clifford.

A mining camp, whether of the 19th or early 20th century, could well be described as a largely "unstructured, unorganized patch" of concentrated activity (Mellinger 1971:257), with rudimentary government, minimal public facilities and few of the institutions associated with more organized community life. The mining culture was characterized by a "tremendous acquisitiveness," accentuated perhaps by the fact that fortune-hunting in the mountains of central Nevada was largely a matter of substantial risk and no small amount of luck (Burkhart 1952:13). An equally significant characteristic was the high degree of transiency, as people moved in and out of camps, and the camps themselves waxed and waned according to the fortunes of the mines.

In such a context, social institutions that required investment in something other than a chance at material wealth developed only with some difficulty. Their existence thus represented a public attitude that suggested a society gone beyond the camp stage, a society in which concern for quality of life approached that for quality of the ores.

In a place such as Reveille, which in 1880 consisted of two hotelkeepers, one bookkeeper, five miners, a prostitute and a "gentleman" (1880 Federal Census, Nye Co.), the need

for formal social organization was clearly limited, as it was in the great majority of central Nevada's mining camps. But in a few cases, a combination of corporate investment, reasonably sustained productivity, and expansion and diversification of the business community created a feeling of stability among the population that was translated into establishment of schools, churches, libraries, and social, literary, labor and fraternal organizations.

Of the many one-time population centers in central Nevada, only a very few developed beyond the camp stage to the point where they might more properly be called towns. Most notable, of course, were Austin, Eureka and Tonopah, each originally the locus of a very large mining boom, which soon became important regional political, commercial and transportation foci as well. Belmont, though it never grew very large, clung to county seat status long after the area mines ceased to be very productive. This may have been due to its central location in Nye County, and to the fact that until the rise of Tonopah in 1900, no other Nye County mining communities approached Belmont in size or longevity. Belmont was able, by virtue of its political position and attendant commercial concentration, to sustain a feeling of community and retain community institutions. Similarly, Battle Mountain developed less as a mining town than a transportation and commercial center, thanks to the Central Pacific Railroad. Tybo, Manhattan and Round Mountain also exhibited outward indications of community development, although for relatively short periods of time.

Although large-scale corporate investment was crucial to successful exploitation of central Nevada's mineral resources, it tended to create adversary relationships between miners and their employers, and one result was the formation of miners' unions (Smith 1967:202-203; see also Lingenfelter 1974). Early unions tended to be local affairs, developing informally in response to immediate situations. An early example was at Austin in 1865, when Reese River miners were invited "to respond to a proposed reduction in wages by certain San Francisco incorporations" (Reese River Reveille 5 Jan. 1865:1). Mining in the Eureka district was of a heavily corporate nature, and organizations such as the Ruby Hill Miners' Union and the ill-fated Charcoal Burners' Association (see Earl 1969, Grazeola 1969) were developed in response. By the time of the Tonopah boom, labor unions represented many trades and were much more organized. Most influential was the Western Federation of Miners, dating from 1893, which "enjoyed a prosperous period" from 1900 to 1907 (Nevada Comm. of Labor, Report 1917-18:22). The early years in Tonopah saw the organization of a variety of other trades, including carpenters and electrical workers, machinists, musicians, and barbers (Ibid. 27-28).

Fraternal organizations, although formally established for social and benevolent purposes, no doubt had a labor dimension, if only because their membership tended to be composed of like-minded individuals. Many of these groups had national affiliations, for example the IOOF (with lodges in Austin, Eureka, Belmont, Battle Mountain, Tybo and Grantsville), Templars (Eureka), the Masons (in Austin, Belmont and Eureka) and Knights of Pythias (Eureka, Austin and Battle Mountain) (Angel 1881:240-46, 249, 251-56, 258-59). Other groups included the Ancient Order of Hibernians and the Irish-American Benevolent Association, both in Austin (Angel 1881:262; Ancient Order of Hibernians, Austin, Record of Meetings for 1874), and the Independent Order of Foresters in Eureka.

When possible, both labor and fraternal organizations built lodge halls. Most of these were in the larger towns of Eureka, Austin, and Tonopah, but the Masons' built a hall in Belmont (1874) as did the Miners' Union in Berlin (Berlin Miners' Union, 1902). Lacking buildings of their own, many groups met above stores and town halls, or shared space with other organizations. The latter was often the case with women's groups. For example, the Austin Masons' female auxiliary, Eastern Star, met in the Masonic hall, and that town's Literary Association shared space in the Irish American Hall (Eastern Star Records, n.d.; Austin Literary Association, Minutes 1879-).

While labor and fraternal organizations were by definition male strongholds, women in the larger central Nevada communities participated in literary societies and women's clubs. The latter were strictly for women, but common literary interests drew both sexes, as was the case in Austin's Library Association. Tybo also boasted a literary society, the object of which was "the mental improvement of its members" male and female (Tybo Literary Society Record Book, 1876-80). Held weekly at one or another member's house, meetings included such activities as oration, poetry, geographical games, instrumental music and writing exercises. Although the social aspect of such gatherings helped to sustain interest, they were not without serious value. Mary M. Godat, who served as president of the Tybo Literary Society during January-April 1880 and was later elected Wyoming's first female legislator, attributed her success to the "training in parliamentary law" she received in Tybo (Ibid.).

The Nevada Federation of Women's Clubs, organized in 1908, included among its affiliates clubs in Tonopah and Manhattan. The latter, officially named the Toiyabe Club, had the "smallest membership in the Federation" (Nevada

Federation of Women's Clubs, Yearbook 1913-14:49), but was active enough. The group had a clubhouse and library, and in 1913-14 provided the local school with drinking fountains and playground equipment, and served refreshments during the 1914 July 4 festivities (Nevada Federation of Women's Clubs, Yearbook 1913-14:33).

Libraries and reading rooms were not unknown in central Nevada mining towns, but a transient population and precarious tax base worked against public funding of such institutions (Newman 1969:5). In most population centers, church, union or civic groups took the initiative in organizing circulating libraries and reading rooms, but in other cases a few books at the local newsstand or post office sufficed (Newman 1969:6). The only known instance of construction of a building specifically for library purposes occurred at Tonopah. Tonopah's first library was assembled through donations, and like much else in town first opened in a tent. In 1905, Grace Roberts Moore donated a town lot, and construction funds were raised through public events and entertainments for a library then built by John J. Hill (Newman 1969:28).

Churches were another means by which people in central Nevada's mining towns sought a feeling of community, but religious development progressed with no little difficulty. In camps and towns filled with "speculators and gamblers", transients and large numbers of single men (Trout 1916:146), perhaps the most that could be said was that "if not theoretically religious," the population was "for the most part practically so" (Angel 1881:191). This "practicality" tended to give short shrift to religious observances; as F. S. Spaulding discovered in 1905, "Lent does not seem to make any difference in Tonopah" (Spaulding, 31 March 1905).

It is interesting to note that, unlike the earlier agrarian frontiers of America, revivalism and camp meetings gained few followers in Nevada (Trout 1916:149; Angel 1881: 195). Instead, denominations with "strong centralized government"--Roman Catholic, Episcopalian and Methodist in particular--had the most success (Trout 1916:150). However, churches, like much else in the region, were at the mercy of the mining economy, and their histories tended to follow a common pattern. Initial organization would be followed by purchase of a lot and erection of a church, which in most cases was soon after sold as local mines closed and the congregation moved away (Trout 1916:159).

Despite these difficulties, churches were erected in most of central Nevada's larger towns. Episcopalians built in Austin (St. George's, c. 1873), Eureka (St. James, 1871),

Belmont (St. Stephen's 1874), Tonopah (St. Mark's, 1904), and Battle Mountain (St. Andrew's, 1905) (Trout 1916:152-3; Bradley 1959:22). Catholics attended Mass at St. Brendan's in Eureka and St. Augustine's in Austin, and Methodists organized in Eureka (1875), Ruby Hill (1876) and Austin (1864) (Trout 1916:157-8; Angel 1881:210). Austin's Methodist Episcopal Church was called the "largest in the state" after the Catholic church in Virginia City (Angel 1881:210). It was built in 1865 with funds raised through sale of stock in the Methodist Mining Co., a corporation organized when parishioners donated not cash, but interests in mining claims, to the building fund. The company eventually realized over $250,000, and was able to build a fine church and "at the same time serve the Lord, do good, and make money" (Angel 1881:210). Unfortunately, Austin's first boom collapsed before the full costs of construction were met. The building was "sold for a courthouse," and later re-acquired by the Methodists' Church Extension Society (Trout 1916:156).

The work of the Presbyterians, although they were as strongly centralized as the Catholics, Methodists and Episcopalians, was "expensive, and not as a whole successful" (Angel 1881:214), as two examples show. A church was established in Austin in 1864, with services held in the county courthouse; but the White Pine boom lured many members away, and the group ceased to meet after 1873 (Angel 1881: 216). More dramatic was the fate of Eureka's Presbyterian church, organized in 1873. One Sunday in 1881 the pastor, George Gallagher, stood before his congregation, "renounc[ed] the tenets of orthodoxy, resign[ed] his charge" and became a Unitarian--an act hardly designed to further the cause of Presbyterianism in that town (Angel 1881:216-7).

Labor unions, fraternal organizations, women's clubs and churches all functioned as visible expressions of the search for, and a sense of, community in the camps and towns of central Nevada. Despite transiency and preoccupation with wealth (or lack thereof), the larger camps and the towns at least brought people together in sufficient numbers to foster development, however tenuous, of these community institutions.

The enormous role of mining in the region's history has tended to obscure the fact that acts of community building were not limited to the inhabitants of mining towns. On the contrary, the valleys of central Nevada may have sheltered far more durable communities, in spite of the handicaps of a small population and great distances.

There were, basically, two societies in central Nevada, one dependent upon ore and the ability to extract and process it; the other upon the natural environment and the ability to live and prosper under its constraints. The two societies were to an extent interdependent: townspeople ate the farmer's foodstuffs and meat, fed their horses with the rancher's hay and oats, and when travelling from town to town enjoyed the hospitality of the way stations. In turn, ranchers and farmers frequented local businesses, deposited their crop and livestock earnings in local banks, and on occasion invested in local mines.

Although the mining and agricultural societies had common interests, they operated under very different premises. While there was always a chance, however remote in actuality, that one might realize sudden riches in the mining economy, prosperity in the agricultural sector demanded investment not only of money, but of time and patience, neither of which was in large supply in a mining camp. Furtheremore, agriculture was very much a family affair, in contrast to the overwhelmingly male societies of mining camps, and of towns in their first boom. Thus central Nevada's agricultural society was characterized by a continuity and persistence, despite vagaries of weather and market forces, that fostered a sense of community far beyond that found in the large majority of mining camps.

Owing to the sparse population, great distances and continual demands of ranch life, the agricultural society did not participate extensively in religious and social activities that were the outward expressions of community in towns. Although a visit to town, for shopping or business reasons, brought members of the ranch community in contact with people, events and ideas outside the valleys, ranch families were still relatively isolated from one another, and certainly from ranches in valleys other than their own.

The local post office, the way station and the school appear to have contributed significantly toward lessening this isolation. The post office and stage station provided access to, and communication with, the world outside the valley confines. They also presented an opportunity for communication within the valley, as inhabitants came in from distant ranches to check the mail or pick up goods or equipment brought in by stage or freight. Coming a fair way on rough roads, members of the valley community would probably linger awhile, exchanging news and views and information, and perhaps make a few purchases if the postmaster or station keeper kept a small stock of goods or staples on the premises.

The rural school, because it was locally administered, paid for and attended by the members of the valley society, also appears to have functioned as an expression of community. Schools were not unique to rural areas: all of central Nevada's larger towns, and a few smaller ones, had schools at one time or another (see Nevada Supt. of Public Instruction, Annual Reports 1865-). But lack of formal religious and social organizations among the ranching population meant that the local school often functioned as the real center of social and community activity in the valleys (Trout 1916:148; Gaw 1956:38).

Those characteristics of life in 19th century Nevada--transiency, distance and poor roads--hampered, but did not discourage, development of education in the region (Gaw 1956:37). Organization of local school districts, with early provision for consolidation, was an effective response to these conditions. Local administration was certainly more practical in many isolated areas of central Nevada, and consolidation helped the educational system deal with changing fortunes of mining districts and the ranch population (Gaw 1956:1, 11; King 1954:143).

Construction of school buildings was largely a local responsibility, and lack of public funds, particularly in the early decades, meant that many schools were built through private subscription (Gray 1948:37). Predictably, this resulted in schools of varying materials and quality. Statewide statistics for 1865 reported buildings of wood and brick, and also several (materials unspecified) that "disgrace the state" (Nevada Supt. of Public Instruction 1865:9). In the report for 1877-78, the range of materials had increased to include buildings of stone and adobe, and again there was a handful deemed "unfit for use" as well as several described as "rented" (Nevada Supt. of Public Instruction 1877-78).

Although central Nevada's first schools were located in principal mining centers where most of the population lived, spread of settlement throughout the region soon required additions to the educational system. The result was establishment of "strictly ranch schools," for children of farmers, ranchers and hands, each school organized and operated by the local agricultural community (King 1954:129). It did not necessarily follow, however, that organization of a ranch school meant construction of a proper school building. Buldings there were, for example at Silver Creek (466), near Millett's in Big Smoky Valley (1008), at Ox Spring (347), Iowa Canyon (467) and Diamond Valley (1055). But in other cases, a room in a ranch or farmhouse was

sufficient, as in the Reese River school district and in the early years of education at Silver Creek (King 1954:129).

Although funding and operation of ranch schools involved the participation of all families in the school district, some ranchers and their families seem to have been particularly active in fostering education in their valley communities. Whether this interest resulted from a school being located at a family's own ranch has not been determined, but it is certainly possible that this was indeed the case. Reports from the State Superintendent of Public Instruction, particularly those from the 1890-1925 period, help to chart the formal participation of ranchers, their wives and grown children in local education, as school district clerks and as teachers. Examples include the Maestrettis (Smith Creek School District), the Bardolis at Ox Spring (Cherry Spring, later Italian School District), the Steiners near Austin (Park School District), the Watts at Silver Creek, and the Ernsts and Goldbachs in Monitor Valley (Pine Creek School District). For several of these families, involvement in school affairs stretching to World War I and in some cases beyond, is illustrative of their long-term investment, financial and personal, in central Nevada's agricultural community. Antonio Maestretti was farming on Smith Creek as early as 1879, as was George Watt at Silver Creek; Daniel and George Ernst, and Charles Goldbach were recorded as living in Monitor Valley in 1870 (1870 Federal Census, Nye Co.), and Leopold Steiner was in the Austin area by that year.

Another early settler active in local school affairs was George Schmidlein. The Kingston School District was organized by 1887, with Schmidlein (2209) as clerk. Schmidlein, whom the federal census located in Big Smoky Valley in 1870, clerked for the school district to 1900, and again from 1903 to 1910. Another Schmidlein, Walter, clerked for the "Big Smoky School District," possibly a revival (and renaming) of the old Kingston District.

A ranch that combined agricultural pursuits with post office, way station or school activities would likely have become a focal point, to a greater or lesser degree, within the valley community of which it was a part, simply because the multiple functions brought people together in one way or another, and into contact with the outside world. West of Garden Valley, on a stage line from Eureka, was the Tonkin Ranch (2148), where at the turn of the century the Damele family operated the Tonkin post office and served as clerks and teachers for the Damele School District. The Romano Ranch (2146), on the western edge of Diamond Valley, also had stage connections to Eureka in the early 20th century. A post office was located there in 1904-14 and 1919-29, and

members of the Romano family clerked for the Sulphur Springs School District from 1899 to about 1910.

The Pine Creek District's school may have been located on the Pine Creek Ranch (2189), which was in the 1870-80 period both a stage station and post office, and which Tasker Oddie of Tonopah fame and later Governor of Nevada developed as a summer home and "model farm" in 1902-03 (Tonopah Bonanza 7 June 1902:1; 25 April 1903:6). William Potts' "Empire" ranch (1010), on a stage line from Austin, had a post office from 1898 to 1941. It also may have been the site of the school for the Monitor District, for which Potts and his wife served as clerks from 1893 to 1904. Cloverdale Ranch (352) may have begun its long history as a way station as early as 1867. Operated by William, and later Archie, Farrington and T. J. Bell, Cloverdale was not only an active stock operation but also a post office in 1886 and 1889-99; and during the 1890's Bell was clerk for the Cloverdale School District, which very probably was centered on the Cloverdale ranch.

Many aspects of central Nevada history come together on the region's ranches. Farmers and ranchers were central Nevada's first real settlers--people who came to invest their lives and fortunes in the long-term proposition of agriculture and livestock raising. Thrown upon their own initiative, they made full use of resources available to them. They constructed their ranches of local materials; they sought water and enhanced its usefulness by building irrigation systems and dams, digging wells and erecting windmills; their livestock fully exploited the potential of the range. Their persistence, and the fact that they remained in place while the mining economy and society ebbed and flowed around them, gave them important roles in developing and sustaining transportation and communications systems throughout the region, and allowed them to develop a continuity and community that underlies much of the central Nevada experience.

OCCUPATION AND LAND USE: A SYNTHESIS

Limitations imposed by the natural environment have influenced human occupation and land use from the earliest period. Arid climate, poor soils, temperature extremes and lack of water have on the whole discouraged, if not prohibited, extensive modification of the physical environment, with the result that the land has remained relatively unaltered by human occupation even to the present day. Modification of the landscape--with cities, roads, farms, artificial lakes--requires technology, and the will to invest in technology is determined by the potential for high returns. The severity of the central Nevada environment was such that incentives to technological development by native or Euro-American populations were, with the notable exception of mining, for the most part lacking. The result was a pattern of occupation and land use describable more as adaptation to the environment rather than as manipulation or modification of it. The necessity to "make do" with available resources was thus a hallmark of central Nevada life from the earliest times.

The historic settlement pattern of central Nevada developed out of two major forms of land use: extraction of minerals and the range livestock industry. Mining occurred, to a greater or lesser extent, in all the mountain ranges, and required the use of a significant amount of the region's water and timber resources. Central Nevada mining was also characterized by high levels of technological development, with much of the machinery and equipment of this technology imported from California and moved from place to place in response to new discoveries of ore. The range livestock industry, which grew out of an initial scattering of small farms, also utilized the region's limited water resources, with most ranches located in or near the foothills of mountain ranges, close to springs or streams. Natural meadows sometimes existed near these water sources, and where such meadows were lacking, ranchers developed large and small irrigation systems to grow hay, barley, and eventually alfalfa, the latter a staple of winter feeding. The livestock industry required little in the way of technology, and was thus characterized by intensive use of locally available resources. The various range types, from sagebrush-grass to creosote, sustained both sheep and cattle, although overgrazing was a problem as early as the 1880's. Ranch buildings and structures were until well into

the 20th century products of the local environment, constructed of stone, adobe, wattle and daub, pinyon and juniper, and mud. Other materials were salvaged from the mining sector, including milled lumber and corrugated metal. Exploitation of early 20th century technological developments in agriculture was limited principally to improvement of irrigation systems (including pumps and windmills), use of newer haying machines and introduction of barbed-wire fencing.

Although mining and ranching coexisted in time and space, settlement patterns arising from these activities displayed important differences. Transiency was a notable characteristic of central Nevada's mining history: while many camps and towns were established during the late 19th and early 20th centuries, only a small number lasted more than a few years. Almost totally dependent upon richness of ore and availability of technology to process it, most mining camps were simply places for people to live while they exploited mineral resources, rather than long-term investments in the development of communities. The principal exceptions, Eureka, Austin, Battle Mountain, Tonopah (and possibly Belmont), achieved the status of viable communities not only because they grew up in the richest mining districts, but also because they participated actively in commercial and transportation networks that encompassed all of central Nevada, and functioned as service and market centers for surrounding agricultural populations.

The agricultural sector, on the other hand, appears to have displayed a greater degree of persistence and stability. While mining camps rose and fell rapidly, their populations sometimes moving en masse along with their buildings to new sites, prime ranching areas (with the requisite abundance of water and grazing) were quickly taken up--certainly by 1880 and perhaps even earlier. Although weather, market forces and luck to a large extent determined the success or failure of ranching enterprises, association of a number of families with individual ranches over many years, and long-term occupation (by various persons) of many more, suggests a continuity of life and society seldom found in all but the largest and most durable of central Nevada's mining centers.

The physical landscape of central Nevada has altered little in the course of the 20th century, many changes being quantitative rather than qualitative. There are fewer people, fewer population centers, fewer major roads, fewer occupied ranches, and the individual prospector and small-scale mining operation are now things of the past. Economies of scale have resulted in the consolidation of many ranch holdings, so that fewer ranchers own more land and more

livestock, and the abandoned ranch is a common phenomenon. While basic activities of range livestock operation have changed little since the mid-19th century, the Taylor Grazing Act of 1934, establishment of the Bureau of Land Management in 1946, and of the Battle Mountain District in 1952, brought extensive federal regulation to the region. This regulation has become more important and more controversial as political, demographic, energy and agricultural demands on the land have increased. Mining has become exclusively a corporate activity, and with improvements in transportation, miners commute from existing towns, rather than setting up camps in the old way. The mines of northern Lander County are close by Battle Mountain, and not far from Winnemucca; and new mining ventures around Tonopah have simply increased that town's population. One of the few examples of recent town-building is Gabbs, which grew up in the 1940's around a large brucite operation run by Basic Refactories of Ohio (Nevada Highways and Parks 15 (1955):29-30).

The character of transportation has changed with the loss of population and the coming of the automobile. Beginning in the 1920's state and federal governments developed a network of paved roads, which resulted in the concentration of travel along a few routes and abandonment of many roads that had long served frieght and stage traffic. Paving was expensive, so its use was limited; and the number of people remaining in the foothills and valleys of central Nevada was insufficient to permit maintenance of an elaborate road network in an increasingly unpopulated region. Furthermore, the major impetus to the development of highways was, once again after 70 years, the moving of people <u>through</u> central Nevada, principally to and from California and then to and from Reno/Carson/Tahoe and Las Vegas, rather than <u>into</u> the towns and valleys of the region (Elliott 1973:263). National enthusiasm for transcontinental travel was first generated by the Lincoln Highway Association, whose "demonstration" route was completed through Nevada in 1926 (Elliott 1973:263), running through Eureka and Austin. An alternative route, from Ely to Los Angeles, was the Midland Trail (924), which followed roughly the old Current-Nyala road and then went on to Tonopah (Lincoln Highway Association 1935:7-8, 166). The old Humboldt route retained its importance as the main thoroughfare across Nevada with its inclusion in the federal interstate system of the 1950's.

Concentration of traffic encouraged concentration of people along these highways, and thus it is hardly accidental that central Nevada's most durable population centers remain Eureka, Austin, Battle Mountain and Tonopah. Their traditional roles as service centers for outlying agricultural regions were augmented, beginning in the 1920's, by a growing

tourist trade. Sportsmen and sightseers were encouraged to visit by such organizations as C. C. Boak's Western Good Roads and Tourist Routing Association in Tonopah, which provided road maps and information to prospective travellers (Boak papers, n.d.; King 1954:65, 68).

Central Nevada's participation in the state's tourist trade has, however, been largely that of servicing people en route to major centers of activity to the west and south. Around the turn of the century, a popular interest in spas and mineral waters led to the development of pools and baths at Spencer Hot Springs (1003), Walti Hot Springs (2147) and, most notably, Darrough's (354), where a 10-room hotel and a bathhouse were built in 1908-09 (Berg 1942:60-61). None of these enterprises were located on main roads, however, and their facilities did not in the long run attract much business. Legalization of gambling in 1931 brought to Nevada an industry that is now the state's most profitable, but it developed principally in western Nevada and Las Vegas, which were closest to the major metropolitan areas of San Francisco and Los Angeles. Battle Mountain thus has derived substantial income through provision of hotel, restaurant and auto services to interstate traffic en route to Reno and Lake Tahoe, while Tonopah has benefited from its location on the highway between those centers and Las Vegas. Austin and Eureka have enjoyed less success since the interstate supplanted the Lincoln Highway as the principal transcontinental route, and the population of their outlying agricultural regions has been too small to sustain significant commercial activity. Eureka retains its status as county seat, but Austin has recently lost the Lander County seat to Battle Mountain, in continuation of a political phenomenon encountered again and again in American settlement history. However, the fact that "progress" has to a large extent passed them by has resulted in the preservation, if only through poverty, of much of Austin's and Eureka's 19th century character. In recent years, appreciation of this legacy has fostered local interest in maintenance, restoration and repair, and in the development of a small tourist industry based on a nationwide enthusiasm for structural relics of the past.

CULTURAL RESOURCES SURVEY AND MANAGEMENT: OBSERVATIONS AND RECOMMENDATIONS

The Bureau of Land Management has been charged through a system of law and administrative rules with the identification and protection of cultural resources on lands under its jurisdiction. Ideally, such a mandate should result in prompt instigation of systematic, comprehensive surveys to identify and evaluate historic, architectural and archaeological resources, and the development of programs to ensure protection or, when all else fails, adequate mitigation of loss through full recording. Such goals are seldom realized, however, in large part because cultural resources must compete with other programs and priorities for funds and time. Despite great gains during the past decade, it is unfortunately still true that at all levels of government, cultural resource management and protection tends to be a low-priority item.

Within Nevada, as a whole, efforts to develop a comprehensive, systematic approach to cultural resource survey and data management face a number of problems. In 1978, Charles Hall Page & Associates of San Francisco prepared a Procedures Manual for cultural resource inventory in Nevada. The manual included a list of twelve "findings" related to existing survey activity in the state. Many of these findings are still valid, for the state and also for federal agencies such as the BLM. Because little has changed since 1978, and the findings are important, it is appropriate to repeat most of them here, with additional comments pertinent to this study for the BLM-Battle Mountain District.

1. There are very few identified architectural resources in the State of Nevada. In the Battle Mountain District, it is perhaps more correct to say that, while many architectural resources have been identified (through completion of site forms), they have not been properly interpreted as architecture.

2. Historic industrial sites have not been surveyed. This is still true, despite work by Texas Tech University which was largely limited to library research and included very little field investigation or technological interpretation.

3. There are no cultural resource surveys specifically related to ethnic settlements and their history. The Battle Mountain District, however, has noted when possible the existence of resources associated with ethnic groups, for example Chinese at Cortez and historic Native American

occupation in and around Tybo. In central Nevada, there were few, if any, concerted attempts to establish "ethnic settlements," and the immigrant population was by and large scattered throughout the region. Exceptions are related to occupation, for example camps for Swiss/Italian charcoal burners.

4. Archaeological resources surveys greatly outnumber any other resource surveys. This is certainly the case today, in large part because the archaeological community has for many years taken a direct interest in archaeological resources, which for those scholars are the only source of information about prehistoric cultures. In contrast, historians have not, until very recently, considered cultural resources a useful form of documentation, or worthy of study beyond the antiquarian. Architectural history, which as a discipline derives from study of art history, has traditionally focused on "high style" or eastern colonial architecture. Only in recent years has the value of vernacular and folk architecture been recognized. Thus, lack of strong, and vocal, interest on the part of the professional historical and architectural communities has contributed significantly to the small number (relative to archaeological investigations) of historical and architectural surveys in many areas of the U.S., including Nevada.

5. Most identification activities have been conducted by federal agencies. This is hardly surprising, since the vast majority of land in Nevada is federally-owned, and federal agencies are bound by law and executive order to identify and protect cultural resources under their jurisdiction. Nevada's small population, and its concentration in a few large cities, may also have contributed to lack of interest in cultural resources surveys at the state and local levels.

6. There is a wide variation in the content, degree of thoroughness and quality of the existing survey activities. This variation is evident in surveys conducted in the BLM-Battle Mountain District, as noted in this study's chapter on Past and Current Investigations. Some of this variation is inevitable, given the many different purposes of surveys and levels of project planning. Some, however, is due to lack of comprehensive research design and to lack of a consistent recording format.

7. Cultural resources are being destroyed at an alarming rate in certain parts of the state. Vandalism, deterioration, neglect, and pressures of population, tourism and

industrial development continue to take their toll. Without broad public interest in preservation of cultural resources, the best efforts of government will continue to have only limited success.

8. There is no single agency in the state which coordinates survey activity. Although the State Historic Preservation Office is charged with responsibility for the conduct of a statewide inventory of cultural resources, the federal presence in Nevada is large enough to overshadow the state effort, and the amount of cooperation between these two levels of government is variable. Among federal agencies, too, there seem to be problems of coordination, with each agency going its own way, for the most part, on matters involving cultural resource surveys. The geographical scope of surveys is often arbitrarily determined by the proposed boundaries of a federal project (for example, URS/Blume's survey for the Department of Energy) or, less justifiably, by jurisdictional boundaries of Federal agencies. The current project to develop overall research designs for future archaeological investigation in Nevada should, if successfully implemented, improve the situation considerably, as would establishment of similar research designs for historical surveys.

9. There is no central location for the collection and storage of inventory data from around the state. Although the Nevada State Museum is the designated state repository for archaeological survey data, lack of funding appears to have limited the Museum's ability to keep up with the large amount of survey information being generated by government agencies and individual investigators. Furthermore, the Museum's program is geared primarily to archaeological resources, with historical and architectural site data included only incidentally. As shown in the Past and Current Investigations chapter of this study, there has been unnecessary duplication of effort in the conduct of historic site surveys. Many sites have been recorded repeatedly, while many others have not been recorded at all. Ideally, the Nevada State Historic Preservation Office should be the central repository for historic and architectural site data, where future researchers could quickly determine what is already on record, and then develop surveys to go beyond the existing data. Such a central repository would allow researchers to study site data from outside their own survey area, and to put their own findings in a statewide or regional context.

In addition to the foregoing observations developed by Charles Hall Page & Associates, several other comments can be made concerning the BLM-Battle Mountain District's own cultural resource programs. Basic concerns appear to be lack of a comprehensive inventory, lack of contextual understanding of resources, and lack of public support for, or interest in, recognition and protection of these resources. On the plus side, the Battle Mountain District has made a sincere effort to record, however rudimentarily, historic resources encountered in the course of various field investigations for other purposes, and also those brought to its attention by the public. The District has also directed some effort toward interpreting these resources, through Unit Resource Analyses and Patrick Welch's historical study of the Shoshone-Eureka Planning Unit. In the matter of public interest, the BLM is hampered by the fact that the "preservation constituency," actual or potential, is very small, simply because so few people inhabit the region. Most public interest in historic preservation appears to be focused in the major towns, which are largely outside BLM jurisdiction. Also, public interest in the BLM's cultural resource programs may be colored by what seems to be resentment of the Federal presence, caused in large part by rising political and public controversy over land use and exploitation of natural resources.

Of course, any action the Battle Mountain District takes to ameliorate problems in cultural resource management will require expenditure of time and funds above that now allocated to these programs. There are, however, a number of activities the District might initiate to at least improve upon current efforts; they fall between the ultimate goal of full-scale, comprehensive inventory and interpretation and the worst-case situation of doing nothing or abandoning the programs entirely.

(1) The scope of current efforts to record historic resources could be enhanced in the following way:

Prior to field investigation (for whatever actual purpose), BLM personnel and cultural resource contractors should consult aerial photographs, survey maps and USGS topographic maps, and note all instances of past and present historic cultural remains located within the entire township(s) in which the field work is to occur. This should include historic resources already recorded, if they have not been subject to field examination, or if such examination occurred more than a year ago.

Once in the field, investigators should locate and record (photographically at the very least) those resources appearing on the maps and in site record files, or note a lack of physical remains. This will necessitate travel beyond that required for the specific project at hand, but the cost and time will be less than if investigators made a special trip from Battle Mountain or Tonopah for the purpose.

(2) Without the services of a qualified professional in history/architectural history, the BLM must rely on existing personnel to collect physical data about historic resources. Such reliance invariably results in production of information that varies in both quantity and quality. One way to mitigate this situation is development of field inventory forms that, while not guaranteed to produce the desired information, would certainly encourage the collection of more, and more pertinent, data than appears to be the case with BLM's current forms. Forms NSO-6230-2 and NSO-6230-5 (March and April, 1976, respectively) are simply inadequate for recording standing structures or complexes. Form N6-811-2 (January 1978) is an improvement, because it provides adequate space for a physical description, statement of significance, and references. However, this form relies heavily on the ability of the individual completing it to observe and record pertinent characteristics of the resource. While archaeologists are trained to identify important elements of an archaeological site, they do not necessarily have (nor should they be expected to have) the knowledge required to do the same for historic structures (as would be the case with an historian or architectural historian confronted with a rock shelter or lithic scatter). Therefore, the best form for recording structures is one that asks specific questions and provides a range of possible answers, thus ensuring a measure of consistency in the data. In Appendix B are sample historic structures inventory forms from Maryland, North Carolina, Iowa and Connecticut. Although they vary according to the needs of each state, these samples all direct the recorder to specific aspects of a building or structure, asking questions that can be answered swiftly through simple observation.

Inventory forms similar to these could be developed for the BLM Battle Mountain District that would take into account the fact that the majority of the District's historic/architectural resources derive from agricultural and mining activities. Appendix C offers a possible format for inventory of these kinds of resources. Ideally, a

manual of instructions for completing forms should be developed. An interim step, however, would be to compile a slide presentation for BLM people likely to be involved in field work, that would point out the various features discussed on the forms. These forms could also be used by members of the public who wish to bring various historic resources to BLM attention.

(3) The BLM should continue efforts to computerize cultural resource data. Computerization should significantly facilitate management of site records, and would make data more immediately accessible. The file would be easy to update and correct, and the computer's sorting capability would allow use and examination of data to meet a variety of needs and circumstances.

Probably the most difficult task in computerizing cultural resource information, as Roberta McGonagle has pointed out (Personal communication from R. L. McGonagle, July, 1980), is determining how data will be used, and then deciding on the kinds of data to be included in the file. These are not easy decisions, whether the issue is computerization or simply designing site forms for manual storage and retrieval. The problem is perhaps most intractable with regard to prehistoric cultural resources, which, to much greater extent than in historical research, function as the "primary," and often only, source of information on past cultures and lifeways. The situation is further complicated, as McGonagle has again noted, by the fact that data needed by cultural resource managers may be different from data desired by academicians or even private consultants. Yet all three groups are actively working in the region, often to very different ends (Personal communication from R. L. McGonagle, September, 1980).

However, priority should be given to facilitating the work of cultural resource management since without proper management there will be few cultural resources left for historians, archaeologists, or architectural historians to study in the future. The first goal of data collection (with or without intent to computerize) should therefore be to obtain that "core" of information most needed for cultural resource management. As long as this "core" is in place, other kinds of data can be collected as desired by various investigators, academic or consultant. If data are computerized, it is possible to use either packaged or specifically designed "software" that would permit addition of data beyond the management core in the future. This

could be done by leaving space sufficient to add variables in the original softward design, or by "translating" to expand the file. If it hasn't done so already, BLM-Battle Mountain should consult others who have developed computerized cultural resource systems. For example, the Montana state office of BLM has published a Cultural Resources Automatic Data Processing System Guidebook (1978). This ADP System has been designed as a cultural resources management tool, with emphasis on inventory and evaluation. While perhaps not directly translatable to the needs of BLM in Nevada, the ADP system certainly offers a model for consideration.

(4) Public interest in cultural resources might be generated through development of a pamphlet series, each number featuring a particular site, subject, or report of activities and findings of a survey. If this could not be managed by one district alone, perhaps the BLM districts throughout Nevada could develop the series jointly. Possible topics are horsetraps, stage stations, a ranch such as Cloverdale that has many associations with the region's history, a mining district, the forms and materials of rural architecture. The pamphlets could also, in the course of presenting historical information, discuss laws and regulations governing cultural resources, how they work and why they exist. Presenting the role of the BLM in the form of a case study focusing on a particular resource or survey might help the public better understand the reasons for, and intricacies of, federal participation in cultural resource management and protection.

Other possibilities include a newsletter and photo exhibits or slide/tape presentations, the latter perhaps made available to community groups or schools. Newspapers are often interested in articles about local history or historic sites; features editors should be contacted in this regard. BLM personnel might also arrange to give illustrated talks, again for community groups or school classes, that would combine information about the land and its natural and cultural resources with the work of the Bureau itself.

Concerning cultural resource survey as a whole, in the Battle Mountain District, and in Nevada generally, one of the most serious shortcomings has been lack of a comprehensive framework, or research design, within which to conduct specific inventory and evaluation projects. Lack of such a research design has meant that contextual issues often go unaddressed; yet it is only with development of an appropriate context that individual resources or groups of resources can be properly evaluated and interpreted.

Although efforts to develop research designs for Nevada prehistory are currently in progress, under the coordination of Dr. Margaret Lyneis of the University of Nevada, Las Vegas, this program is largely limited to consideration of prehistoric archaeology. The investigators propose to treat historic archaeology only in a "preliminary" fashion, and other kinds of historic and architectural resources not at all. From a practical point of view, this exclusion is probably wise, in that the current project could become quite unwieldy and perhaps collapse under its own weight. Far better would be a concurrent program to establish research designs for Nevada history and architecture, with participants drawn from the scholarly community, appropriate state and federal agencies, and also including interested members of the public at large, such as informed community representatives or members of local historical groups. Just as "study units" will be identified for Nevada prehistory, study units appropriate to Nevada history (including archaeology) and architecture can be developed. A good example for consideration is Cultural Resources in Massachusetts: A Model for Management (Massachusetts Historical Commission, 1979).

At the present time, however, there do not seem to be any serious plans to develop research designs for further study of historic/architectural resources in Nevada, yet the responsibility of the BLM-Battle Mountain District for such resources continues and must be met, one way or another. While it is well beyond the scope of this Class I Inventory to establish comprehensive research designs for the District's history and architecture, it has been possible to develop a framework that could serve as an interim approach. This framework is based upon major themes identified in the course of this study as of particular importance in the historical development of central Nevada. It is presented in Appendix D as a series of thematically-derived strategies for use in planning future surveys, and for use as basic reference points for examination and interpretation of historic/architectural resources encountered in the field. The sections include notes on time period, appropriate geographical scope for study, and kinds of resources associated with each theme. Also included are research questions to be asked, and if possible, answered, in the course of investigating each theme.

In presenting the results of an historical or architectural survey, whether for information, National Register nominations or Determinations of Eligibility, a description of the survey should accompany the list of potentially eligible resources. The selected resources should be clearly

placed in historic context, and the presentation should include at least a general discussion of all resources identified during the survey, their kinds and numbers, and why some were selected for nomination over others. Furthermore, all eligible resources identified through the survey should be included in a request for a Determination of Eligibility or other planning document, regardless of ownership or jurisdiction. (Nominations to the National Register should also be prepared to include all eligible resources, through preparation of historic district, thematic, or multiple-resource nominations, although this effort will be complicated by recent legislation pertaining to nomination of privately-owned properties.) Inclusion of all resources holds whether the survey is concerned with way stations, a mining district or districts, horsetraps, log architecture or settlement. This inclusion also presupposes that historic/architectural surveys in central Nevada are conducted to fully cover all potentially eligible resources, rather than those located only on BLM or Forest Service lands. In fact, it is strongly urged that BLM identify those survey topics which would involve a joint effort on the part of these two agencies, and make a concerted effort to develop a program to carry them out.

It is recognized, however, that the BLM will need to address the future of many historic/architectural resources long before time and money are available for surveys. This is, in fact, a major failing of the Federal government's entire program for "protection and enhancement of cultural resources." Neither federal agencies nor SHPO's have been given adequate time, money or personnel to identify, much less evaluate, cultural resources as part of the overall planning process. The results have been unrecorded loss of many significant resources, protection of others that do not deserve it, and public controversy. This situation is not likely to improve, for BLM or anyone else, in the near future.

In the meantime, however, BLM can make constructive use of the information already at its disposal by:

- Using the historical narrative and survey recommendation portions of this overview to place historic/architectural resources in context. The context for each resource should be described on inventory forms as an integral part of the recording process;
- Using the historic township survey maps, aerial photos and topographic maps to predict location, density and in some instances types, of historic resources in a proposed project area;

-Establishing priorities for surveys, based on the location and nature of projects proposed for the region;
-Developing a research design based upon one or more of the strategies suggested in this report, that will best fit the types of resources expected to exist in the area of a proposed project. If the actual survey is conducted by an outside contractor, BLM should see to it that the research design is carried out to specifications, by that contractor.
-Organizing existing site data according to survey topics, and studying these to determine the extent (or lack thereof) of existing data and also the kind and amount of data needed to complete a survey and make evaluations. Then bend every opportunity, BLM's or other investigators', toward gathering the data that will complete the survey.

APPENDIX A

Capsule Histories of Mining Districts and Mineral Occurrences within the Bureau of Land Management Battle Mountain (Nevada) District; with notes on production

Note:

Production figures listed as "Total Production" are from Couch and Carpenter (1943). If "No recorded production" is listed it means that Couch and Carpenter record no production. Often these production figures will differ from those listed in other sources and quoted in the sketches. There are several reasons for the apparent contradictions. First, the statistics on which Couch and Carpenter relied were collected for tax purposes by the counties. The provisions of the tax laws excluded certain types of ore as well as ore below a certain value per ton. Second, enforcement of tax laws was probably lax, especially in remote districts, and in those districts where a great deal of leasing was going on. Finally, it was possible, and common, to cheat in reporting bullion production. Thus, the figures Couch and Carpenter list are probably low. On the other hand many other sources of production figures may not be totally accurate. Angel's History of Nevada (1881) was in part a grand promotional piece and inflated production figures were part of the show. No attempt here has been made to sort out discrepancies where they occur.

Alpha District (Silver, Lead) Eureka County (18)

Very little is known about the early history of this district. Some production apparently occurred in 1909, 1912, and 1917 (Roberts 1967:65) but this does not appear in Couch and Carpenter (1943). Lincoln (1923) mentions that a ten-stamp concentrator was built 3 miles west of the prospects, but it did not prove a success.

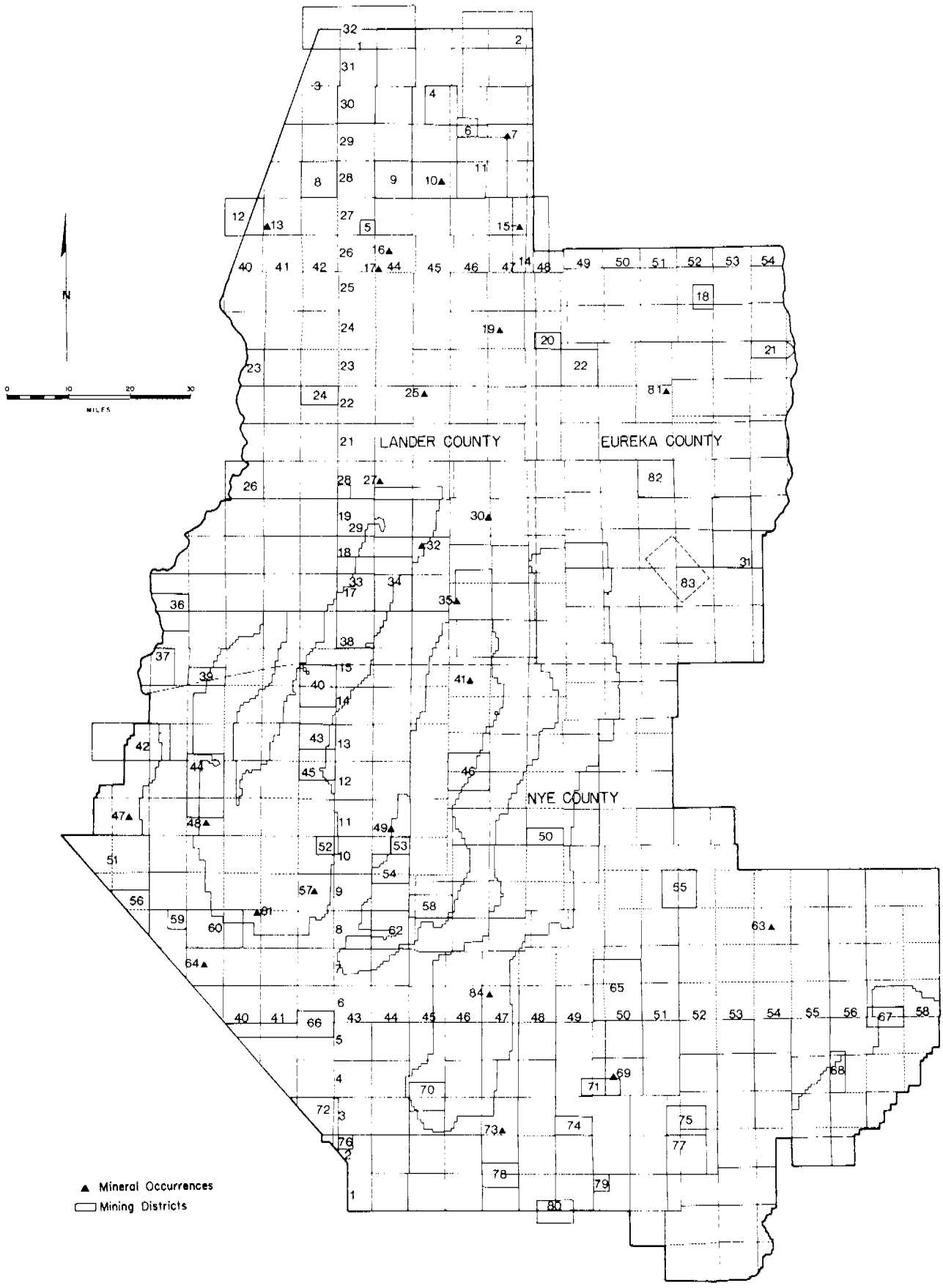
No recorded production.

Antelope District (Zinc, Lead, Silver) Eureka County (22)

This district was discovered shortly after Eureka, twenty miles south, and was heavily prospected without significant results (Angel 1881:428; Roberts 1967:65).

Total Production: $87,380

1. Battle Mountain District
2. Argenta District
3. Buffalo Valley District
4. Lewis District
5. Warm Springs Area
6. Hilltop District
7. White Rock Mine
8. McCoy District
9. Mountain Springs Area
10. Greystone Mine
11. Bullion District
12. Jersey District
13. Black Eagle Area
14. Cortez District
15. White Horse Mine
16. Pinto Mine
17. Blackbird Area
18. Alpha District
19. Jimmy Allen Mine
20. Roberts District
21. Diamond District
22. Antelope District
23. Wild Horse District
24. Ravenswood District
25. Iowa Canyon Mine
26. New Pass District
27. Green Tree Mine
28. Skookum District
29. Reese River District
30. Dry Creek Mine
31. Eureka District
32. Laurent Mine
33. Big Creek District
34. Birch Creek District
35. Spencer Hot Springs District
36. Gold Basin District
37. Aspen District
38. Kingston District
39. Jackson District
40. Washington District
41. Indian Blue Mine
42. Lodi District
43. Millett District
44. Union District
45. Twin River District
46. Northumberland District
47. Paradise Peak Area
48. Milton Canyon Area
49. Gold Hill District
50. Danville District
51. Fairplay District
52. Jett District
53. Jefferson Canyon District
54. Round Mountain District
55. Morey District
56. Athens District
57. Horse Canyon Mine
58. Belmont District
59. Black Spring District
60. Cloverdale District
61. Colton Mine
62. Manhattan District
63. Silverton District
64. Easter Blue Mine
65. Tybo District
66. San Antone District
67. Troy District
68. Willow Creek District
69. Warm Springs Mine
70. Hannapah District
71. Clifford District
72. Tonopah District
73. Jumbo Mine
74. Bellehelen District
75. Arrowhead District
76. Ellendale District
77. Reveille District
78. Golden Arrow District
79. Eden District
80. Silverbow District
81. Mt. Hope Area
82. Lone Mountain District
83. Fish Creek District
84. Longstreet Area



Map 9: Mining Districts and Mineral Occurrences, BLM-Battle Mountain District, 1862-1940

Argenta District (Barite) Lander County (2)

Silver was discovered in the area in 1867 and a small town--Argenta--sprang up. The town was abandoned in 1870 when Battle Mountain was established. There is no recorded silver production for the district. Barite mining began in 1930 (Stager 1977:62).

Total Production: Over $3,000,000 in barite, 1930-1969

Arrowhead District (Silver, Gold) Nye County (75)

This district was probably discovered in the early twentieth century. Lincoln (1923:158) mentioned that two mining companies were then active in the district doing development work. Only recorded production is for the years 1920 and 1939.

Total Production: $4,755

Aspen District Lander County (37)

Little is known about this district. It was probably discovered in the early 1900's.

No recorded production

Athens District (Silver, Gold) Nye County (56)

The Athens District was probably discovered in the early 1900's, but nothing is known about its early history. Lincoln (1923:159) reported that the Warrior Gold Mining Company mine produced $20,000 in gold bullion and that two companies were then developing mines. Recorded production from the district is from the late 1930's.

Total Production: $53,319 (1935-1940)

Battle Mountain District (Silver, Gold, Copper, Antimony) — Lander County (1)

The Battle Mountain District was organized in 1866 but was probably discovered several years earlier. By 1870, 32 mines and two smelters were in operation; but the mines were not noted for outstanding production, and by 1883 production in the district ceased. In 1897 the Glasgow and Western Mining Company acquired many of the mines in Copper Canyon and Copper Basin and began development on copper deposits with production beginning in 1910. Glasgow's efforts proved unsuccessful and the properties changed hands many times in the following decades. In 1967 the Duval Corporation acquired the properties and developed the Battle Mountain mine.

Placer gold was discovered in the district in 1909, with sporadic placer activity occurring over the next forty years. The majority of the drift mines were located in Copper Canyon and several hydraulic monitors worked the placers of Copper Basin in 1912-1913.

In 1947 the dredge working the placers of Manhatten Gulch (Nye County) was moved to the fan at the mouth of Copper Canyon. Between 1947 and 1955 the dredge recovered over 100,000 ounces of gold (Lincoln 1923:106-107; Johnson 1973:87; Stager 1977:66; Welch 1979:18-19).

Total Production: $4,825,080 to 1940

Bellehelen District (Silver, Gold) — Nye County (74)

Nothing is known about the early history of this district. Church (1923:159-160) reported that the Bellehelen Merger Mines Company was building a 50 ton per day cyanide mill in the district. The mill only ran a few months in 1923, was rehabilitated in 1927 and ran a short time (Kral 1951:17-19). The only recorded production was in 1918.

Total Production: $29,473

Belmont District (Silver, Gold) Nye County (58)

The Belmont district was discovered in 1865 and was rapidly organized. Belmont was a prosperous camp, becoming the Nye county seat in 1867. In 1866 the first mill in the district was built, with ten stamps. The next year a twenty stamp mill was built, and in 1868 a forty stamp mill began operations. The first mill ceased operations in 1869. The second suspended operations in 1868, resuming operations in 1878 for only a few months. The forty-stamp mill ceased operations in 1876. The mines themselves were active until 1891 although only 12 tons of ore, worth $2,423, were mined that year. The mines were quite wet.

The twentieth century saw several attempts to revive the district through consolidation and introduction of new milling technologies. All were short lived (Angel 1881:519-522; Lincoln 1923:160).

Total Production: $3,790,518

Big Creek District (Antimony) Lander County (33)

The Bray Mine was originally located in 1864 as a silver mine; but neither it nor any of the other claims in the district were ever developed. The Bray Mine was relocated in 1891 and was worked intermittently until 1898. The Pine Mine, north of Big Creek, shipped some antimony ore in 1890. Lincoln (1923:109) reported that mining had resumed in 1916 and 1917. Production has been sporadic since (Stager 1977: 71).

No recorded production.

Birch Creek (Gold, Silver) Lander County (34)

The district was discovered in 1863 and the camp of Geneva formed. Clinton, established a year later, became the major town for the district. In 1865 Clinton boasted a sawmill and a four-stamp mill, ". . . reported to be incapable of reducing anything but the hopes of [the] miners who shipped their ores to it for treatment." In 1866 a twenty stamp mill was erected, but it shortly shut down for lack of ore. By the end of 1867 the camps were deserted; the mines closed.

Intermittent activity was reported in the district 1910-1912, 1919, and during the '40's and '50's. A small amount of uranium ore was mined 1955-1960 (Lincoln 1923: 109-110; Angel 1881:472-473; Stager 1977:72).

No recorded production.

Blackbird area (Manganese) — Lander County (17)

No further information.

Black Eagle area (Manganese) — Lander County (13)

No further information.

Black Spring District (Diatomaceous Earth) — Nye County (59)

Lincoln (1923:161) reported that Nature Products Company was mining diatomaceous earth in the district. It was used as the basis for "Superdent Tooth Powder" and "Super Dental Cream."

No recorded production.

Buffalo Valley District (Gold, Silver, Manganese) — Lander County (3)

The district was discovered in 1866 or 1867. Nineteenth century mining activity was limited to some placering and to a small quantity (10 tons) of ore shipped in 1870. Between 1925 and 1941 Buffalo Valley Mines sporadically operated a 10 ton per day cyanide mill. Manganese was mined between 1942-47 and 1950-54 (Stager 1977:74).

No recorded production.

Bullion District (Silver, Gold, Lead, Copper, Arsenic, Turquoise) — Lander County (11)

The early history of the district is uncertain. Lincoln (1923:110) lists Lander as the oldest camp in the district and the milling center for the district in the 1870's and '80's. Gold was discovered in 1907 around Tenabo and a minor rush occurred. By 1912 both Tenabo and the district had begun their inevitable decline. The Gold Acres mine started operations in 1935. In 1942 the mine was open pitted and operated until 1961. The Bullion District is also noted for its turquoise (Stager 1977:75).

Total Production: $450,369

Clifford District (Silver, Gold) Nye County (71)

The district was discovered in 1906 and supported a town of 500 a year later. Kral (1951:42-43) estimates the production of the district at less than $500,000.

No recorded production.

Cloverdale District (Silver, Gold, Lead, Copper) Nye County (60)

Lincoln (1923:165) reported that the district was being explored and developed in 1905. Production began in 1906 and continued until 1919. Some placer gold has been recovered in the district. The mines have been sporadically worked since 1920 (Kral 1951:44).

No recorded production.

Colton Mine (Fluorspar) Nye County (61)

Also known as the Western Fluorspar Mine or the Cottonwood Canyon Mine. No dates or production figures (Horton 1961:17).

Cortez District (Silver, Gold, Lead, Zinc) Lander and Eureka Counties (14)

Prospectors from Austin discovered the Cortez district in 1863. An eight-stamp mill with roasters and pans was erected in Mill Canyon in 1864, later enlarged to sixteen stamps. Rich ore was discovered in the Garrison mine in 1868 and the Garrison became the principal mine in the district. Ore was milled at Mill Canyon until a new mill, a leaching plant, was built at Cortez in 1886. Water for the mill had to be piped seven miles.

After the death of Simeon Wenban, the district's largest owner, in 1895, most of the properties were worked by leasers. In 1908 a cyanide mill was built to work the Cortez mill tailings. In 1919 the Consolidated Cortez Silver Mines Company gained control of the major properties in the district. They built a 100 ton per day concentration and cyanide mill in 1923, enlarging it in 1927. The Consolidated's mill closed in 1930 and production in the district has been sporadic since (Lincoln 1923:86; Roberts 1967: 69-72).

Total Production: $6,375,839

Danville District (Silver, Gold) Nye County (50)

The district was discovered in 1866 and reorganized in 1870. Some production is recorded for the early 1870's. By 1880 the district was dormant. In 1944-45 a small amount of development work and production took place (Angel 1881: 516-517; Lincoln 1923:166; Kral 1951:53).

Total Production: $4,747

Diamond District (Silver, Lead, Zinc, Gold) Eureka County (21)

The district was located and organized in 1864 but little was done in the district until two years later, when several tons of ore were taken to Austin. A smelter was built in the district in 1873 and a small amount of bullion was produced. Some development work was reported by Lincoln (Angel 1881:429; Lincoln 1923:87).

Total Production: $29,881

Dry Creek Mine (Turquoise) Lander County (30)

Discovered in 1932, this mine has produced more than $400,000 in gem quality turquoise (Morrissey 1968:21-22).

No recorded production.

Easter Blue Mine (Turquoise) Nye County (64)

This turquoise mine has been worked intermittently since its discovery in 1907.

No recorded production.

Eden District (Silver, Gold) Nye County (79)

The Eden District was discovered in 1905 but never amounted to much. A thirty-five ton mill was built in 1938 but this only worked sporadically (Lincoln 1923:166; Kral 1951:53).

No recorded production

Ellendale District (Gold, Silver) Nye County (76)

High-grade gold ore was discovered in 1909, and the district flourished until 1916. Most of the work during this period was done by leasers. Some work was done during the late 1930's (Kral 1951:54-57; Koschmann 1968:192; Lincoln 1923:167).

Total Production: $77,612

Eureka District (Lead, Silver, Gold, Zinc) Eureka County (31)

The Eureka District contained the first important lead-silver mines in the United States. Although the district was discovered in 1864, no significant activity occurred until 1870 after Major McCoy built a smelter that could successfully treat Eureka's lead silver ores. Between 1870 and 1885, the Eureka district produced over $40 million in lead, silver and gold. The two major smelters in the district shut down in 1890 and 1891 after the amount of ore produced by leasers became insufficient to warrant operations.

A revival began in 1905 with the merger of the Eureka Consolidated Mining Company and the Richmond Consolidated Mining Company. The revival was cut short in 1910 when the Eureka-Palisade Railroad was washed out. In the 1940's and 1950's several companies attempted to redevelop the Eureka mines. Although small quantities of ore were discovered and mined, these efforts were not a commercial success (Angel 1881:428-435; Lincoln 1923:88-89; Nolan 1962:2-3).

Total Production: $52,288,024

Fairplay District (Gold Silver) Nye County (51)

"The Fairplay District was discovered in 1905 and made small annual productions up to 1911. Two properties produced in 1920" (Lincoln 1923:167).

No recorded production.

Fish Creek District (Lead, Silver, Gold) Eureka County (83)

Discovered in the late 1870's, the Fish Creek District never produced significantly. Roberts (1967:85-90) says that the only production occurred in 1938 and 1955.

No recorded production.

Gold Basin District (Gold, Silver) Lander County (36)

The discovery of gold in the area in 1911 lead to a small rush to the district. The town of Carroll was established and production is recorded for 1912. The district was not as rich as hoped and it was quickly abandoned.

Total Production: $7,226

Gold Hill District (Gold) Nye County (49)

The early history of the district is unknown. Some gold was recovered in 1931-32 but the district has been dormant since (Koschmann 1968:192).

No recorded production.

Golden Arrow District (Gold, Silver) Nye County (78)

The district was discovered in 1905. Production from the area has been small (Lincoln 1923:169).

No recorded production.

Green Tree mine (Turquoise) Lander County (27)

Discovered in 1937. Production unknown (Morrissey 1968:21).

No recorded production.

Greystone Mine (Barite) Lander County (10)

No information.

No recorded production.

Hannapah District (Silver, Gold) Nye County (70)

The Hannapah mine was discovered in 1902 and the district was prospected for several years. Some ore was shipped from the district in 1914 and 1922.

Total Production: $146 (1871?)

Hilltop District (Gold, Silver, Copper, Lead) — Lander County (6)

The district was discovered in 1906 and a minor boom occurred two years later. A ten-stamp amalgamation mill was built in 1912, and later changed to a cyanide mill. In 1922 a 100 ton per day flotation mill was built but it only ran a few months before being scrapped (Lincoln 1923:111; Stager 1977:80). Some mining occurred in the mid and late 1930's.

Tota Production: $424,669

Horse Canyon Mine (Mercury) — Nye County (57)

The Horse Canyon mine is located in an unnamed district along with several other prospects. The mine was discovered in 1937 and some production occurred from small mercury retorts prior to 1942. A twenty-ton furnace was set up in 1942 and ran sporadically for two years (Bailey 1944:155-156).

No recorded production.

Indian Blue Mine (Turquoise) — Nye County (41)

This mine may have been worked by the Indians of the region in prehistoric times. The mine was discovered and worked by Anglo-Americans in 1925 (Morrissey 1968:24).

No recorded production.

Iowa Canyon Mine (Fluorspar) — Lander County (25)

A small prospect. No further information (Horton 1961:12).

No recorded production.

Jackson District (Gold, Silver) — Lander and Nye Counties (39)

The district was discovered in 1880. In 1893 three claims and a mill site were patented and sold to the Nevada Mining Company. This company erected a mill and "operated for quite a period." In 1921 the Nevada Mining Company property was reorganized as the Star of the West Mining Company. They built a 50 ton per day mill which made a trial run only. The properties of the district were worked sporadically in the 1930's and 1940's (Lincoln 1923: 170-171; Kral 1951:77).

Total production: $3,061

Jefferson Canyon District (Gold, Silver) — Nye County (53)

The district was located in 1866 but there was little interest in it until a test lot of ore, sent to Austin in 1871 for milling, yielded $28,800. Two ten-stamp mills were erected in 1874 by the two major mines in the district. By 1877 the district was in decline. A third mill was built sometime before World War I. It was reconstructed in 1917 and ran briefly in 1918 and 1927.

Total Production $506,545

Jersey District (Silver, Lead, Mercury) — Lander County (12)

The Jersey District was discovered in 1874. A year later 500 tons of ore were shipped to Oreana, Nevada for smelting. A small smelting furnace was built in the district but was unsuccessful due to lack of flux. Considerable ore was shipped from the district between 1880 and 1910. In 1919 and 1920 some mercury was produced from a small retort furnace in the district (Angel 1881:474; Lincoln 1923:207).

Total Production: $28,466

Jett District (Silver, Lead, Zinc) — Nye County (52)

The district was discovered in 1876 and became active in 1880. Some ore was shipped to Eureka for smelting (Lincoln 1923:172).

No recorded production.

Jimmy Allen Mine (Turquoise) Lander County (19)

This mine was discovered in 1933 from float on the surface down slope from the veins (Morrissey 1968:20).

No recorded production.

Jumbo Mine (Barite) Nye County (73)

No information.

No recorded production.

Kingston District (Gold, Silver) Lander County (38)

There has been sporadic activity here since the early 1860's. In 1875 there were four mills in the district; however, none of them ran more than sporadically due to poor ore. A sixty stamp mill operated intermittently after 1909 (Angel 1881:472, 473, 476; Lincoln 1923:112).

Total Production: $18,726

Laurent Mine (Barite) Lander County (32)

A small barite prospect.

No recorded production.

Lewis District (Silver, Gold, Lead, Antimony) Lander County (4)

The Lewis District was discovered in 1867 and by 1876 two mills were in operation. In 1880 a branch line of the Nevada Central Railroad was built up Lewis Canyon. The line was never able to justify its existence and was finally dismantled in 1890. Gold was discovered in the district in 1882 at what would become the Pittsburg and Morning Star Mines. The Pittsburg Mine is of interest because ore from the mine was sent by aerial tram to the mill in the canyon below. The Pittsburg mill operated until 1892.

Several attempts were made to revive the district in the twentieth century but all were failures, until Noble Getchell started up a 100 ton per day flotation mill in 1922. This mill recovered more than $2 million between 1923 and 1929 (Emmons 1910:122; Lincoln 1923:113; Welch 1979:19-20).

Total Production: $3,188,805

Lodi District (Silver, Gold, Lead) Nye County (42)

The Lodi District was first organized in December 1863 as the Mammoth District. A ten-stamp mill was erected in 1871 that treated ore from the Lodi district and from the Union and Belmont districts as well. The mines first discovered proved not to be very rich. In 1874, however, new discoveries were made in the western part of the district and considerable ore was produced. By 1880, however, activities in the district had ceased.

A revival of sorts began in 1905 with the rehabilitation of many of the old mines and construction of a small smelter in 1908. This smelter proved unsuccessful. In 1916 a 30 ton per day cyanide plant reworked the tailings at Ellsworth. Five years later a rich gold strike was made and the district produced until 1927 (Angel 1881:523, 525; Lincoln 1923:174; Kral 1951:93).

Total Production: $809,905

Lone Mountain District (Silver, Lead, Zinc) Eureka County (82)

Although discovered in 1920, this district was not a significant producer until 1943. Production between 1943 and 1964 is listed as $781,102 (Roberts 1967:90-92).

No recorded production (up to 1940).

Longstreet area (Gold, Silver) Nye County (84)

Discovered in 1903, the district was a sporadic producer. A 100 ton per day cyanide mill was built in 1929 (Kral 1951:99-102).

No recorded production.

McCoy District (Gold, Iron) Lander County (8)

The district was discovered in 1914, but saw little activity until the discovery of high grade gold ore in 1928. A 20 ton per day amalgamation mill was built in 1930 to reduce the ore. By the close of 1932 the district was on the decline.

The district was marginally more successful as an iron producer. Up to 1954 55,000 tons of ore were hauled to Battle Mountain for shipment overseas (Shawe 1962:110-116; Stager 1977:86).

Total Production: $56,270

Manhattan District (Gold, Silver) Nye County (62)

The district was discovered in 1905 and the inevitable rush occurred. Placer mining began the following year on a large scale and produced significant amounts of placer gold until 1915. Vanderburg (1936:126-127) states that five miles of Manhattan Gulch were worked by placer drift mines, some nearly 100 feet deep. Lode mining began in 1908 and discovery of rich ore on the lower levels of the White Caps mine in 1916 led to another boom. In 1917 the Associated Mill, built in 1912, was reconstructed to include a roasting furnace.

As in many other districts, the 1930's saw a revival of mining in the Manhattan District. This revival was in both the placer and the hardrock mining portions of the district. In 1938 a floating dredge began to work gravels in Manhattan Gulch. Between 1938 and 1946, when it was moved to Battle Mountain, the dredge recovered 133,000 ounces of gold ($4.5 million) (Koschmann 1968:193; Lincoln 1923:175; Vanderburg 1936:126-127).

Total Production: $6,999,507

Millett District (Silver, Gold, Lead, Copper) Nye County (43)

The Millett District, also known as the North Twin River District, was discovered in 1863. The principal mine in the district, the Buckeye, shipped ore to Austin to be milled. The district experienced a minor revival in 1905 and small productions were made from 1906 to 1916. A five stamp mill operated from 1911 to 1913 (Lincoln 1923:177-178).

No recorded production.

Morey District (Silver, Gold, Lead) Nye County (55)

Ore was first discovered in the area in 1865 and the Morey District was organized in 1866. The town of Morey was established, and ore shipments to Austin began, in 1869. In 1873 a ten-stamp mill was built, but it ceased operations after one month. Until 1880 ore was shipped to Tybo for reduction. In April, 1880 the mill started up and ran for eight months, producing $9,000 worth of bullion per month. Production in the district continued until 1891 at about the same small level.

Total Production: $462,972

Mt. Hope area (Lead, Zinc) Eureka County (81)

Lead-zinc deposits were discovered here in 1870 by Basques who ran charcoal furnaces in the area. The Mt. Hope Mine opened in 1886 and considerable development work (but little production) was done sporadically through 1940. A mine and mill, built in 1940, operated until 1947 when a fire destroyed the powerhouse. Total production 1940-1947: $1,335,393 (Roberts 1967:103).

No recorded production.

Mountain Springs area (Barite) Lander County (9)

Barite mining began in the area in 1948 (Stager 1977: 87).

No recorded production.

New Pass District (Silver, Manganese) Lander County (26)

The district was discovered in 1865 and a small stamp mill was moved there from Austin in 1868. The camp and the district remained mostly idle until 1900 when some activity in the district resumed. It was shortlived, however, and the Post Office closed in 1904. The Nevada Austin Mines Company built a 100 ton per day cyanide mill (date unknown) but it was unsuccessful. Some intermittent activity occurred in the 1930's (Lincoln 1923:385; Stager 1977:88).

Total Production: $450

Northumberland District (Gold, Silver) Nye County (46)

The Northumberland District was discovered in 1866. What happened after that is unclear, as Lincoln and Angel differ substantially on their dates. Lincoln states that ore was shipped to Austin until 1868 when a ten stamp mill was built. The mill ran only a short time and the district was abandoned by 1870. Angel reports a similar train of events, but with different dates. According to Angel, the ten stamp mill was built in 1879, at the same time as the town of Northumberland was established. Angel reports that the mill ran only three months and that the town was abandoned by 1881. Couch and Carpenter (1943) tend to lend more credibility to Angel's report: in 1879, 275 tons of ore were mined, yielding $7,077 in silver bullion; only 2 tons were mined in 1868 (Angel 1881: 522; Lincoln 1923:178).

In 1935 low-grade gold ore was discovered in the district and the Northumberland Mining Company organized. From 1939 until 1942 they recovered $1,146,475 in gold from their open pit operations (Kral 1951:135).

Total Production: $459,066 (up to 1940)

Paradise Peak area (Tungsten, Mercury) — Nye County (47)

No information.

No recorded production.

Pinto Mine (Turquoise) — Lander County (16)

Discovered in 1901, the Pinto mine has been a small producer (Morrissey 1968:19).

No recorded production.

Ravenswood District (Copper, Lead, Silver, Gold) — Lander County (24)

The district was organized in 1863 and worked intermittently thereafter. Angel (1881:475) reported that most of the claims in the district were abandoned in 1881 (Lincoln 1923:114).

No recorded production.

Reese River District (Silver, Gold, Lead, Copper) — Lander County (29)

The Reese River District was the first major mining district discovered in central Nevada, and it set off almost two decades of exploration in the region. The production history of the district is rather lackluster. Major mining activity was hindered until 1869 by metallurgical problems with the ore. In 1865 the Manhattan Silver Mining Company began to acquire the major mines and mills in the district, an effort that was essentially complete by 1877. The Manhattan's mill shut down in 1887. An attempt was made to revive the district in the early 1890's but this failed.

Reese River never measured up to people's hopes for another Comstock. Total production amounted to less than $19 million, $16 million of this credited to the Manhattan Silver Mining Company. The annual production of the district fluctuated between $500,000 and $1 million between 1865 and 1885 (Lincoln 1923:114-115; Angel 1881:465-469; Welch 1979:11-18).

Total Production: $18,494,209

Reveille District (Silver, Gold, Lead, Copper) — Nye County (77)

The district was organized in 1866 and was named in honor of the Reese River Reveille by the original locators. In 1867 a 5 stamp mill was erected in the district and two years later a 10 stamp mill was built. Both mills only ran a short time. In 1875 the 10 stamp mill was restarted and ran intermittently for the next several years, producing $1,500,000 in bullion. In 1880 the district was abandoned. Interest in the district revived in 1904, but production since has been irregular (Angel 1881:526; Lincoln 1923:179).

Total Production: $610,982

Roberts District (Silver, Lead, Copper, Zinc) — Eureka County (20)

The district was discovered in 1870. In 1910 a mill was built but operated only a short time before it was disassembled and moved elsewhere (Lincoln 1923:96; Roberts 1967: 104).

No recorded production.

Round Mountain (Gold, Silver, Lead, Tungsten) — Nye County (54)

The Round Mountain District was discovered in 1906 and lode mining began on several properties, with placers discovered the following year. The Round Mountain Mining Company was the district's principal producer. They erected a 150 ton per day mill in 1907 and in 1908 brought water from Jefferson and Shoshone Canyons for hydraulicking. In 1915 a pipeline was built across the valley to Jett Canyon for water. The district enjoyed a steady production record from 1908 until 1919. A revival occurred in the 1930's, as the price of gold and new placering technologies made it possible to work gravels ignored in the first twenty years of the district (Koschmann 1968:193-194; Lincoln 1923: 180-181).

Total Production: $7,834,828

San Antone District (Silver, Gold, Lead, Copper) — Nye County (54)

The district was discovered in 1863. Two years later a 10 stamp mill was built at San Antonio Station, 12 miles north of the district. It operated only one year, then was moved elsewhere. In 1867 a 4 stamp mill was built in the district which ran for a year. The recorded production is from this period ($142,976).

In the twentieth century several companies have tried to work properties in the district. The Tonopah Liberty Mining Company built two mills at the Liberty Mine but both were unsuccessful (Angel 1881:518; Lincoln 1923:181-182).

Total Production: $142,976

Silverbow District (Silver, Gold) — Nye County (80)

The district was discovered in 1905, with the first ore shipments beginning in 1906. In 1913 a 2 stamp mill was built. A 20 stamp mill was erected by the Blue Horse Mining Company in 1920 but it shut down the next year.

No recorded production.

Silverton District (Silver) — Nye County (63)

No information.

No recorded production.

Skookum District (Silver, Gold) — Lander County (28)

The district was discovered in 1907 and a minor and shortlived boom took place the next year.

No recorded production.

Spencer Hot Springs District (Tungsten) — Lander County (35)

Tungsten was discovered in the area in 1941 and was mined on a small scale until 1957. The Linka District is included in this district (Stager 1977:98).

No recorded production.

Tonopah District (Silver, Gold, Lead, Copper) Nye County (72)

The Tonopah District was discovered in 1900 and within five years had become one of the most important silver-gold producers in the United States. Initial development was undertaken largely by leasers because outside investors were unwilling to gamble on such a remote district. By 1904 Tonopah's spectacular production attracted numerous investors. In that year a railroad link was completed with the Southern Pacific Railroad at Sodaville. The first mill in the district was built at Millers, twelve miles west of Tonopah on the railroad, in 1906. This was the first of many mills in the district; by 1915 seven mills with more than 300 stamps total were reducing ore in Tonopah.

The Tonopah Mining Company and the Tonopah-Belmont Mining Company, both organized in 1902, accounted for 60% of the nearly $150 million produced between 1900 and 1940 (Lincoln 1923:184-193).

Total Production: $146,336,102

Troy District (Silver, Gold) Nye County (67)

In the late 1860's, an English company purchased mines in Troy Canyon and built a 20 stamp mill and furnaces. The mill shut down in 1872, only five years after the district had been discovered. There was some prospecting of claims in Irwin Canyon in the early twentieth century but little was found (Lincoln 1923:193-194).

Total Production: $6,239

Twin River District (Silver) Nye County (45)

A party of Frenchmen discovered the Twin River District in 1863. The district's principal mine, the Murphy Mine, was discovered the following year. A 20 stamp mill and furnace was constructed in 1865, to process ore from the Murphy. The mill ceased operations in 1868 after producing more than $2 million in bullion. With the suspension of milling operations the district was abandoned. Work on the Murphy was resumed in 1918 through 1923 and some additional development was done in 1937-1939. Both efforts were without results (Angel 1881:526; Lincoln 1923:194; Kral 1951: 184).

Total Production: $54,548

Tybo District (Silver, Lead, Gold) Nye County (65)

The Hot Creek section of the Tybo district was discovered in 1865 and by 1868 there were two 10-stamp mills in operation. The Tybo section of the district was discovered in 1870. In 1874 and 1875 two smelters were built, their construction bringing prosperity until 1888. In 1917 an attempt was made to rejuvinate the district. A 75 ton per day concentrator was built, but it ran less than a year. In 1919 a flotation plant and smelter were built but these too were unsuccessful. In 1929 the Treadwell-Yukon Company built a 350 ton per day flotation mill which ran until 1937. The Treadwell-Yukon operation produced $6,781,000 in silver, lead and gold (Angel 1881:527; Lincoln 1923:195; Kral 1951:191).

Total Production: $9,570,848

Union District (Mercury, Gold, Silver, Lead) Nye County (44)

The district was discovered in 1863 and the towns of Ione and Grantsville established. Upon petition of miners in the district, Nye County was separated from Esmeralda County in 1864, with Ione as the new county seat. Two 20 stamp mills were built but the district failed to meet expectations. Symbolic of this was Ione's loss of the county seat to Belmont in 1867. A revival ensued with construction of a 20-stamp mill at Grantsville in 1877. The mill was enlarged in 1880 and ran until 1881. In 1905 a 30-stamp mill was built at the Berlin Mine. In 1912 a cyanide mill was built to treat the tailings from this mine.

Mercury was discovered in the district in 1907 and from then until 1920 the district produced 11,000 flasks of the metal (Angel 1881:523; Lincoln 1923:196; Koschmann 1968:195).

Total Production: $3,304,328

Warm Springs area (Mercury) Lander County (5)

Mercury was discovered in the area in 1937 and attempts were made in 1939-41 and 1955-56 to produce it on a commercial basis. These efforts were not successful and less than 20 flasks of mercury were produced (Stager 1977:97).

No recorded production.

Warm Springs mine (Barite) Nye County (69)

A small barite deposit. The mine has produced less than 1,000 tons (Horton 1963:15).

No recorded production.

Washington District (Silver, Lead) Nye County (40)

"The Washington District was organized in 1863 and for a few years was a very active camp" (Lincoln 1923:197). Some development work was done on mines in the district in 1918 and 1919 and again in 1948; no results have been reported (Lincoln 1923:197; Kral 1951:207).

Total Production: $476

White Horse mine (Turquoise) Lander County (15)

A small turquoise prospect (Morrissey 1968:20).

No recorded production.

White Rock mine (Barite) Lander County (7)

No information.

No recorded production.

Wild Horse District (Mercury) Lander County (23)

Cinnabar was discovered in the district in 1916. Mercury was produced sporadically through 1960. Total production of the district was 1,200 flasks (Bailey 1944: 111-112; Stager 1977:99).

No recorded production.

Willow Creek District (Gold, Silver) Nye County (68)

The district was discovered in 1911 and saw some production of free gold in 1913 from the Melbourn vein. Lincoln (1923:198) notes some production in 1913, 1914 and 1917 and that a 5 stamp mill was built in 1921.

Total production: $2,557

APPENDIX B

Historic Site Inventory Forms from Selected States

MARYLAND HISTORICAL TRUST
21 STATE CIRCLE
SHAW HOUSE
ANNAPOLIS, MARYLAND 21401

HISTORIC SITES SURVEY FIELD SHEET
Individual Structure Survey Form

SURVEY NUMBER:

NEGATIVE FILE NUMBER:

UTM REFERENCES:
Zone/Easting/Northing

U.S.G.S. QUAD. MAP:

PRESENT FORMAL NAME:

COUNTY:

TOWN:

LOCATION:

COMMON NAME:

FUNCTIONAL TYPE:

OWNER:
ADDRESS:

ACCESSIBILITY TO PUBLIC:
Yes( ) No ( ) Restricted( )

LEVEL OF SIGNIFICANCE:
Local( ) State ( ) National( )

ORIGINAL FORMAL NAME:

PRESENT USE:

ORIGINAL USE:

ARCHITECT/ENGINEER:

BUILDER/CONTRACTOR:

PHYSICAL CONDITION OF STRUCTURE:
Excellent( ) Good( )
Fair( ) Poor:( )

THEME:

STYLE:

DATE BUILT:

GENERAL DESCRIPTION:
Structural System
1. Foundation: Stone( )Brick( )Concrete( )Concrete Block( )
2. Wall Structure
   A. Wood Frame: Post and Beam( )Balloon( )
   B. Wood Bearing Masonry: Brick( )Stone( )Concrete( )Concrete Block( )
   C. Iron( ) D. Steel( ) E. Other:
3. Wall Covering: Clapboard( )Board and Batten( )Wood Shingle( )Shiplap( )
   Novelty( )Stucco( )Sheet Metal( )Aluminum( )Asphalt Shingle( )
   Brick Veneer( )Stone Veneer( )
   Bonding Pattern: Other:
4. Roof Structure
   A. Truss: Wood( )Iron( )Steel( )Concrete( )
   B. Other:
5. Roof Covering: Slate( )Wood Shingle( )Asphalt Shingle( )Sheet Metal( )
   Built Up( )Rolled( )Tile( )Other:
6. Engineering Structure:
7. Other:

Appendages: Porches( )Towers( )Cupolas( )Dormers( )Chimneys( )Sheds( )Ells( )
Wings ( )Other:
Roof Style: Gable( )Hip( )Shed( )Flat( )Mansard( )Gambrel( )Jerkinhead( )
Saw Tooth( )With Monitor( )With Bellcast( )With Parapet( )With False Front( )
Other:
Number of Stories:_____
Number of Bays:_____ Entrance Location:_____
Approximate Dimensions:_____

THREAT TO STRUCTURE:
No Threat( )Zoning( )Roads( )
Development( )Deterioration( )
Alteration ( )Other:

LOCAL ATTITUDES:
Positive( )Negative( )
Mixed( ) Other:

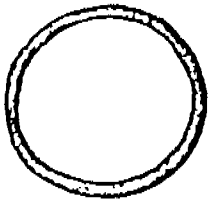
ADDITIONAL ARCHITECTURAL OR STRUCTURAL DESCRIPTION:

RELATED STRUCTURES: (Describe)

STATEMENT OF SIGNIFICANCE:

REFERENCES:

MAP: (Indicate North In Circle)



SURROUNDING ENVIRONMENT:
Open Lane( )Woodland( )Scattered Buildings( )
Moderately Built Up( )Densely Built Up( )
Residential( )Commercial( )
Agricultural( )Industrial( )
Roadside Strip Development( )
Other:

RECORDED BY:

ORGANIZATION:

DATE RECORDED:

NORTH CAROLINA HISTORIC STRUCTURES SHORT DATA SHEET

READ and USE the instruction manual to complete this form. Fill it out as completely and consistently as possible. **PLEASE NOTE:** not all variables are provided for each question and reference to the instruction manual will be necessary. In all cases: 0 or 00 denotes an undetermined or not applicable response
9 or 99 denotes a variable other than those provided; use the space provided to indicate the answer.

SURVEY SITE NUMBER _____ (To be assigned by S & P Branch)

1. SITE NAME: [159–194]

3. ABBREVIATED LOCATION DESCRIPTION OR STREET ADDRESS: [195–244]

4. TOWN/TOWNSHIP/NEAREST COMMUNITY: [245–258]

5. COUNTY: [260 261] Name: _____

6. DATE RECORDED IN FIELD: Month [262 263] Day [264 265] Year [266 267]

7. FIELD RECORDER: _____

10. OWNER NAME: [269–293]

11. OWNER ADDRESS: [294–343]

13. USE: Original Primary [344 347] Other: _____

Present Primary [348 351] Other: _____

Resid/Farm 0101 · Resid/Non-Farm 0102 · Farm Bldg/Indep of Resid 0201 · School 0301 · Office 0401 · Bank 0402 · Gen'l Retail Store 0501 · Industrial 0601-0614 · Gov't Office 0903 · Church 1001 · Museum 1701 · Cemetery 1802 · Site Aban: Unocc 2001 · Mobile Home Adjac 2002 · FHA Home Adjac 2003 · Other Occ Struct Adjac 2004

15. CONDITION: [355] Excellent 1 · Good 2 · Fair 3 · Deteriorated 4 · Ruin 5 · Unexposed 6

18. THREATS TO STRUCTURE: [356] Other: _____

None/Prop Stable 1 · Abusive Alterations 2 · Neglect/Deterioration/Vandalism 3 · Road Construction 4 · Impoundments 5 · Private Dev't 6 · Urban Dev't 7 · Gov't Activity 8

ARCHITECTURAL DATA

21. STYLE DEVELOPMENT: Exterior: [369] Interior: [370]

High/Academic 1 · Std Popular 2 · Simple Vernac/Folk Culture 3 · Vig Vernacular 4

23. GENERAL STYLE GROUPS: Exterior: First [373 374] Second [375 376] Interior: First [379 380] Second [381 382]

Geo 01 · Geo/Fed 02 · Fed 03 · Fed/Gk Rev 04 · Gk Rev 05 · Italianate 06 · Goth Rev 07 · 19/20 c Plain/Trad 09 · Q. Anne 11 · Non-Class Rev 12 · Col Rev 13 · Misc Vict 15 · Std Commercial 16 · Bungalow 33 · Coastal Plain Cottage 33

24. PLAN (Primary Domestic Buildings): [385 386] Other: _____

One Room 01 · Hall & Parlor 02 · Quaker 3 Room 04 · Side Hall 06 · Central Hall 07 · Cent Hall w/Quaker Ver 08 · Tripartite 13 · Irregular 14 · T-Hall 15

26. HEIGHT: [388] Other: _____

1 Story 1 · 1½ Story 2 · 2 Story 3 · 2½ Story 4 · 3 Story 5 · 3½ Story 6 · 4 or More, Not a Skyscraper 7 · Skyscraper 8

27. FACADE WIDTH (Principal Impact): [389] Other: _____

1 Bay 1 · 2 Bay 2 · 3 Bay 3 · 4 Bay 4 · 5 Bay 5 · 6 or More Bay 6

28. DEPTH: [390] 1 Room/Single Pile 1 · 2 Room/Double Pile 2 · 3 or More Rooms 3

29. WINGS AND ADDITIONS: Primary: [391] Secondary: [392] Other: _____

Rear Shed 1 · Rear T or L 2 · Sides 3 · Front 4 · Additional Stories 5

30. CONSTRUCTION: Primary: [393 394] Other: _____

Log 01 | Plank 02 | Mortise & Tenon 03 | Frame, Cut Nails 05 | Load-bearing Masonry 07

31. ROOF CONFIGURATION: Primary: [397 398] Secondary: [399 400] Other: _____

Gable Sides 01 | Gable Front 02 | Ped Gable 03 | Triple A 04 | "X" Gable 05 | Parapet Gable 07 | High Hip 09 | Low Hip 10 | Flat 19

IF THE FOLLOWING ELEMENTS ARE PRESENT, CODE AS SECONDARY:

Belfry 23 | Steeple 24 | Cupola/Lantern 25 | Belvedere 26 | Clock Tower 27 | Widow's Walk 28 | Tower/Turret 29

33. EXTERIOR WALL MATERIALS (Original): Primary: [405 406] Secondary: [407 408]

Plain W'bd 01 | Molded/Beaded W'bd 02 | Brick/Common Bond 04 | Brick Veneer 10 | Stuccoed Brick 13 | Log 17-24

34. EXTERIOR WALL MATERIALS (Replacement): [409] Other: _____

Sidings: Aluminum 1 | Asphalt 2 | Asbestos 3 | Vinyl 4 | Brick Veneer 5 | W'bd 6 | Gar Siding 7 | Similar to Original or in Kind Material 8

35. PRINCIPAL PORCH INTEGRITY: [410] Other: _____

Original 1 | Altered 2 | Not Orig/Negative 3 | Not Orig/Positive 4 | Reconstruction 5 | Removed/Fallen 6

36. PORCH TYPE: [411] Other: _____

Engaged 1 | Attached 2

40. PORCH DETAILS: A. [415] B. [416] C. [417]

Chamfered Posts 1 | Turned Posts 2 | Sawn Work/Turned Ornament 3 | Classical Details 4

42. CHIMNEY INTEGRITY: [419] Other: _____

Original 1 | Partially Rebuilt 2 | Replaced 3 | Removed/Fallen 4

43. CHIMNEY PLACEMENT: [421] Other: _____

Interior 1 | Int End 2 | Int End/Exposed Face 3 | Exterior End 4 | Ext Front/Rear 5

HISTORICAL DATA

38. PERSONS OR EVENTS OF SIGNIFICANCE ASSOCIATED WITH THE BUILDING: (Code Last Name First)

A. Type: [482 483] Date: [484] Name/Event: [485 490 495 500 504]

B. Type: [505 506] Date: [507] Name/Event: [508 510 515 520 525 527]

TYPE: Trad Builder/Craftsman 01 | Architect 02 | Contractor 03 | Attributed Builder 04 | Orig. Owner 05 | Significant Later Owner 06 | Historically Signif Person 07 | Hist Significant Event 08 | Author of Pattern Book 09 | Landscape Design 10

DATE: Pre-1780 1 | 1781-1800 2 | 1801-1825 3 | 1826-1865 4 | 1866-1885 5 | 1886-1915 6 | 1916-1930 7 | 1931-1945 8 | Post 1945 9

ENVIRONMENTAL DATA

61. SETTING: [568] Rural, Undist 1 | Rural, Bit Up 2 | Small Town 3 | Urban, Pop. over 12,500 4

63. QUAD MAP USED: [574 576] Quad Name: _____

64. UTM DATA: Zone: [577] Northing: [578 584] Easting: [583 590] Zone: 16 1 | 17 2 | 18 3

65. DIRECTION BUILDING FACES: [591] N 1 | S 2 | E 3 | W 4 | NE 5 | NW 6 | SE 7 | SW 8

67. FREE COMMENT: [592 595 600 605 610 615 620 625]

[626 630 635 640 645 650 655 660 663]

[664 670 675 680 685 690 695 701]

[702 705 710 715 720 725 730 735 739]

[740 745 751]

HISTORIC RESOURCES INVENTORY
BUILDING AND STRUCTURES

HIST 8 Rev 5 77

148

STATE OF CONNECTICUT
CONNECTICUT HISTORICAL COMMISSION
59 SOUTH PROSPECT STREET, HARTFORD, CONNECTICUT 06106
(203) 566-3005

FOR OFFICE USE ONLY

Town No. | Site No.

UTM

QUAD:

DISTRICT ☐ S ☐ NR | IF NR SPECIFY ☐ Actual ☐ Potential

IDENTIFICATION

1. BUILDING NAME (Common) (Historic)

2. TOWN CITY | VILLAGE | COUNTY

3. STREET AND NUMBER (and or location)

4. OWNER(S) ☐ Public ☐ Private

5. USE (Present) (Historic)

6. ACCESSIBILITY TO PUBLIC: EXTERIOR VISIBLE FROM PUBLIC ROAD ☐ Yes ☐ No | INTERIOR ACCESSIBLE ☐ Yes ☐ No | IF YES, EXPLAIN

DESCRIPTION

7. STYLE OF BUILDING | DATE OF CONSTRUCTION

8. MATERIAL(S) (Indicate use or location when appropriate)

☐ Clapboard ☐ Asbestos Siding ☐ Brick ☐ Other (Specify) _____

☐ Wood Shingle ☐ Asphalt Siding ☐ Fieldstone

☐ Board & Batten ☐ Stucco ☐ Cobblestone

☐ Aluminum Siding ☐ Concrete Type: _____ ☐ Cut stone Type: _____

9. STRUCTURAL SYSTEM

☐ Wood frame ☐ Post and beam ☐ balloon

☐ Load bearing masonry ☐ Structural iron or steel

☐ Other (Specify) _____

10. ROOF (Type)

☐ Gable ☐ Flat ☐ Mansard ☐ Monitor ☐ sawtooth

☐ Gambrel ☐ Shed ☐ Hip ☐ Round ☐ Other (Specify) _____

(Material)

☐ Wood Shingle ☐ Roll Asphalt ☐ Tin ☐ Slate

☐ Asphalt shingle ☐ Built up ☐ Tile ☐ Other (Specify) _____

11. NUMBER OF STORIES | APPROXIMATE DIMENSIONS

12. CONDITION (Structural) ☐ Excellent ☐ Good ☐ Fair ☐ Deteriorated | (Exterior) ☐ Excellent ☐ Good ☐ Fair ☐ Deteriorated

13. INTEGRITY (Location) ☐ On original site ☐ Moved | WHEN? | (Alterations) ☐ Yes ☐ No | IF YES, EXPLAIN

14. RELATED OUTBUILDINGS OR LANDSCAPE FEATURES

☐ Barn ☐ Shed ☐ Garage ☐ Other landscape features or buildings (Specify)

☐ Carriage house ☐ Shop ☐ Garden

15. SURROUNDING ENVIRONMENT

☐ Open land ☐ Wood-land ☐ Residential ☐ Scattered buildings visible from site

☐ Commercial ☐ Indus-trial ☐ Rural ☐ High building density

16. INTERRELATIONSHIP OF BUILDING AND SURROUNDINGS

(OVER)

DESCRIPTION (Continued)

17 OTHER NOTABLE FEATURES OF BUILDING OR SITE (Interior and or Exterior)

SIGNIFICANCE

18 ARCHITECT

BUILDER

19 HISTORICAL OR ARCHITECTURAL IMPORTANCE

SOURCES

PHOTO

PHOTOGRAPHER

DATE

VIEW

NEGATIVE ON FILE

Place Photograph Here

COMPILED BY

NAME

DATE

ORGANIZATION

ADDRESS

20 SUBSEQUENT FIELD EVALUATIONS

21 THREATS TO BUILDING OR SITE

☐ None known ☐ Highways ☐ Vandalism ☐ Developers ☐ Other _____

☐ Renewal ☐ Private ☐ Deterioration ☐ Zoning ☐ Explanation _____

HIST 6 NEWS 77 (BACK)

APPENDIX C

Proposal for Revision of BLM Historic Site Record Form N6-8111-2

DRAFT

151

Historic Site Record
United States
Department of the Interior
Bureau of Land Management
Battle Mountain District

CrNV-06-_____
RIS#:_____
NSM#:_____

CRES Rating_____
CR Report #:_____

Recorder:_____
Date:_____
T_____R_____Sec._____
Map Ref:_____
UTM:_____
Descriptive Location:_____
_____
_____
_____

Resource/Planning Area:_____
Project:_____
County:_____
Land Status:_____

Site Plan:

_____

Site Name:_____
Site Type:
  Single Structure___
  District___ # of structures_____
  Complex___ # of structures_____
  Archaeological Site___

General Description of Site and Its Condition:

For Mining/Milling Sites:

Site Function
  Mining___
  Milling___
  Combined___

For Mine/Combined Sites:

Underground Access
  Adit/Tunnel___
  Vertical Shaft___
  Inclined Shaft___
Number of Headframes____
Size and Shape of Waste Rock
  Tailings Piles:

For Milling/Combined Sites:

Waste Product
  Slag piles___
  Tailings pond/piles___

Features
  Orebins___
  Large Circular Tanks___
  Roasting Oven____
  Smelter___
  Enclosed, not accessible___

Artifacts:

Historical Information (including dates, owners, thematic associations, etc.):

Statement of Significance:

References:

Photographs: Roll/Frame #_____ Location:_____

CRES Rating:_____

	Yes	No	Unknown	Comments
Significant Nationally				
Significant Locally				
Association with Event				
Association with Person				
Representative Type				
Condition (good)				

Evaluator:_____ Date:_____

Title:_____

Structure Description Form

CrNV-06-_____ Structure #_____ Site Name_____

Structure Type: Dwelling__ Barn__ Corral__ Outbuilding__ Commercial__ Public__
Religious__ School__ Kiln__ Mining__ Ore Processing__
Other_____

Past Use:_____ Present Use:_____

Approximate Dimensions:_____
Number of Stories:_____

CONSTRUCTION
Concrete__
Rubble Stone__
Dressed Stone__
Adobe Brick__
Poured Mud__
Log: Horizontal Mass Wall__
Log: Vertical or Palisade__
Timber Frame__
Balloon Frame__
Wattle and Daub__
Fired Brick__
Other_____

ROOF SHAPE
Side Gable__
End Gable__
Hipped__
Shed__
Other_____

ROOF SYSTEM
Not Applicable__
Log__
Framed Truss__
Other_____

ROOF COVERING
Not Applicable__
Shingles__
Corrugated Metal__
Dirt__
Other_____

HEADFRAMES
# of Sheave Wheels___
Orebins Attached to Headframes?_____

FOUNDATION
Stone__
Concrete__
Other_____
None__

List Alterations, Features of Note:

EXTERIOR WALL COVERING
Not Applicable__
Clapboard__
Matched Horizontal Plank__
Vertical Plank__
Shingles__
Corrugated Metal__
Brick Veneer__
Plaster__
Other_____

OPENINGS
Stone Lintel__
Wood Lintel__
Arched__
Wood Frame___

Sketch Floor Plan:

CHIMNEY
Present__
Not Present__
Material_____
Exterior?__ Interior?__

APPENDIX D

THEMATIC APPROACHES TO HISTORICAL/ ARCHITECTURAL RESOURCES

I. Transportation
   A. Railroads
      1. Geographical: the Battle Mountain District. There were few rail lines in central Nevada, and their location is known. The survey could be further divided into the "northern system," including the Central Pacific, Eureka & Palisade, Nevada Central, Eureka-Ruby Hill, Austin City, and Battle Mountain-Lewis; and the "southern system" of rail lines focusing on Tonopah.

      2. Considerations
         a. Time: the historic period.
         b. Resources pertaining to operation of railroads: bridges, tunnels, flag stops, water stops (water tanks), switchyards, roundhouses, maintenance structures, coal tipples
         c. Resources existing as a response to railroads: towns (Palisade, Battle Mountain, Ledlie, Alpha, etc.), hotels, depots and stations, livestock loading pens and chutes, camps for railroad laborers.
         d. Research Questions;
            -Relationship of railroads to the mining sector
            -Role of railroads in development of the livestock industry
            -Relationship of railroads to stage and freight transport
            -Effect of railroads on settlement patterns (compare Lander and Eureka counties with Nye County)

   B. Stage and Freight Transport
      1. Geographical: the Battle Mountain District. Stage and freight transport created a District-wide (and in truth, statewide) web of roads that connected major towns with each other and with mining districts, and ran through all the region's valleys. It would be inappropriate to study only one route, for example Eureka to Belmont, because that route was simply a segment of a much larger network. Exception might be made for the Pony Express and Overland routes, because of their

clear identification with development of transportation and communication across the entire trans-Mississippi west.

2. Considerations
   a. Time: the entire historic period, up to (and potentially including) the time when auto courts and motels took over completely the care and feeding of travellers.
   b. Resources: stage and freight routes, and the stations, bridges and markers located along them; offices of stage and freight lines, such as those operated by W. L. Pritchard, Woodruff & Ennor, William Wilson (Eureka), G. W. Jacobs (Austin), Butler and Clark (Tonopah).
   c. Research Questions:
      -Geographical/chronological development of the network (including stations)
      -Incidence of stations erected by transport companies, or funded by them; stations owned and operated independently
      -Response of the network to changes in patterns of settlement and mining activity
      -Relation and response of network to railroads and to auto travel
      -Relation of stations and their operators to the occupation and agricultural activity of the valleys in which they were located. Do stations become ranches? Do ranches later take on station functions? Do some stations never experience conversion to ranches? Why?
      -Physical characteristics of stations when they were operating as such, both with and without associated ranching activity; materials, building types, size, and what determined these

C. Toll Roads
   1. Geographical: the Battle Mountain District

   2. Considerations:
      a. Time: historic period
      b. Resources: toll routes, toll stations
      c. Research Questions:
         -Period during which toll franchises were granted
         -Reason for toll roads
         -Toll routes
         -Characteristics of toll stations

-Selection of toll station sites
-Contribution (major? minor? none?) to development of transportation networks
-Subsequent history (abandoned? taken over by freight/stage lines? by county?)

D. Highways/Auto
1. Geographical: the Battle Mountain District

2. Considerations:
a. Time: c. 1900-present, coinciding with spread of auto travel (and recognizing that effective cutoff date for cultural resource surveys is 50 years)
b. Resources: major routes, including the Humboldt, Central and "southern" route (Ely-Tonopah) and their 20th century counterparts: I-80, Lincoln Highway, Midland Route; also 8A and 51; gas stations, auto courts, motels, markers (such as those placed along the Lincoln Highway in many parts of the country), stage/freight stations that adapted to auto traffic
c. Research Questions:
-How highways affect population centers, in terms of location, commercial activity
-Effect of highways on stage lines, stations
-Role of highways in tourism

II. Commerce
1. Geographical: the Battle Mountain District

2. Considerations:
a. Time: the historic period
b. Resources: business establishments (stores, warehouses, hotels, livery stables, banks), residences
c. Research Questions;
-Relationship of commerce to mining and agricultural sectors
-Kinds of commercial activity: in large towns, in small camps
-Spheres of influence: Eureka, Austin, Battle Mountain, Tonopah. Do businessmen from these towns stake out commercial "territory" in outlying mining camps? If so, to what extent? Where?
-Relationship of local commercial centers to valley agricultural communities
-Role of various ethnic/nationality groups in commercial activity.

III. Agriculture

Agriculture as an economic activity is perhaps best considered as a whole, rather than being broken into subthemes, which in any case would not be as discrete as those for transportation or industry, for example.

1. Geographical: the Battle Mountain District

2. Considerations

a. Time: While the overall chronological framework should be c. 1860-1940, it is possible to identify several periods of major developments in central Nevada agricultural history:

-1860-c. 1875: The period of initial agricultural activity, characterized by small farms producing a wide variety of commodities, from meat to vegetables, salad greens, and grains, principally for local markets created by the mining boom of the 1860's.

-c. 1875-1890: As the initial mining boom faded, farmers and ranchers turned to intensive development of a range livestock industry, principally cattle but with increasing numbers of sheep. They were aided by proximity of rail lines (principally the Central Pacific), introduction of barbed-wire fencing and windmills, and adoption of winter feeding--the last three being in part responses to the problem of overgrazing that attended increase in livestock numbers.

-c.1890-WWI: This period was characterized by significant growth in the sheep industry. It also saw the beginning of state and federal programs to manage both land and water resources, and also concerted efforts to rid the range of wild horses.

-WWI-1940: In this period, Federal management of the public lands was facilitated by the Taylor Grazing Act and later establishment of the BLM. Artesian wells tapped heretofore inaccessible water sources, helping to mitigate the region's chronic water shortage.

b. Resources: ranches (including dwellings, barns, corrals, pens, sheds, and other outbuildings), horsetraps, corrals at springs and other watering places, windmills, irrigation systems.

c. Research Questions:
   -Ranches as industrial units: forms, materials, arrangement, functions. Do they change over time? If so, how? Do stock cattle ranches physically differ from sheep ranches? From dairy farms? How?
   -Developments in livestock breeding
   -Irrigation systems: technology and methods
   -Horsetraps: technology and methods
   -Role of Basque immigrants in sheep industry
   -Impact of rail lines on agricultural activity
   -Livestock production: Do a few ranchers dominate the industry, or is production fairly evenly distributed among all ranchers? Does this distribution change over time?
   -Sheep vs. cattle: Do sheep (or cattle) predominate in some valleys and not in others? Does this change over time? Do ranchers specialize in one animal, or are there many instances where ranches produce both cattle and sheep?
   -Dairying: characteristics, extent (numerically and geographically)
   -Development of hay farms (Desert Land Entries, corporate farms, etc.)

d. Approaches to evaluation: The fact that one ranch may have run more stock than another does not necessarily mean the larger ranch is more "important." It would be more appropriate to consider the contributions, or example set, by a rancher in enhancing the overall quality or quantity of livestock production in central Nevada, for example introduction of new irrigation methods or breeding stock. Also, the importance of agriculture in the region is due to the fact that many people participated: a <u>collective</u> rather than individual contribution to historical development. Under these circumstances, survey of ranches and other cultural resources associated with agriculture should be geared toward identification of those resources best able to convey understanding and appreciation of various chronological and topical aspects of the region's agricultural history. For example:

-Farms and ranches whose existing structures are characteristic of specific periods of development: an 1860's farm or small ranch, 1880's cattle ranch, a sheep ranch from the turn of the century
-Ranches whose continuous operation from the 1860's to the present is illustrated by the variety of their buildings and structures, in terms of forms, material and use
-Ranches that clearly illustrate specific forms of agricultural activity (sheep, cattle, dairy, horses), or a group of ranches each of which represents a stage in the development of the cattle industry or sheep raising in the region
-Horsetraps (with and without appurtenant structures) that illustrate developments in the art of horsecatching, through their materials and spatial arrangements
-Buildings and structures, (including corrals and pens) that illustrate ranchers' reliance on locally-available materials
-Windmills as examples of developments in agricultural technology
-Irrigation systems, from specific periods or that show development of irrigation methods over time
-Ranches associated with persons who made significant contributions to the livestock industry, such as introduction of new breeds, or crossbreeding, or who "set the pattern" for ranching in a particular valley or region

IV. Industry
A. Charcoal Industry
1. Geographical: the Battle Mountain District

2. Considerations:
a. Time: c. 1875-85
b. Resources: charcoal kilns, pits, and associated structures, including dwellings of charcoal burners, and lumber camps that produced mainly for the kilns
c. Research Questions:
-Factors influencing incidence and location of charcoal kilns
-Ownership: independent or mining companies?
-Kilns: materials and designs

-Charcoal "camps"--relation of industrial and residential structures; types of residential structures
-Role of Swiss-Italian immigrants in the charcoal industry; how they coped with decline in need for charcoal

B. Brewing
1. Geographical: the Battle Mountain District

2. Considerations:
a. Time: the historic period
b. Resources: brewery structures, dwellings of brewery owners, farms owned by brewers for grain production
c. Research Questions:
-Was most liquor produced by a few large firms, or was there a sizable "cottage industry" as well?
-Markets: did brewers supply only the towns in which they were located, or did they ship large quantities to outlying areas (such as mining camps). Were local brewers the principal suppliers for the whole central Nevada region, or did they face serious competition from Virginia City and other western population centers?
-Role of German immigrants in brewing--major? minor?
-Did liquor production remain fairly constant over time, or did it fluctuate along with the mining economy?
-Did any one brewer dominate production in central Nevada, or did brewers develop specific market areas?
-Chronology: beginnings, peak period(s), decline and influencing factors

C. Lumber/Logging
1. Geographical: the Battle Mountain District

2. Considerations:
a. Time: the historic period
b. Resources: lumber camps, sawmills
c. Research Questions:
-Types of wood available
-Principal markets for wood and lumber
-Ownership: independent or mining companies?
-Characteristics of lumber camps
-Sawmills: size, types, machinery

D. Lime Industry
   1. Geographical: the Battle Mountain District

   2. Considerations:
      a. Time: the historic period
      b. Resources: lime kilns, limestone quarries, transportation systems between the kilns and quarries; outbuildings associated with lime production (crushers, storehouses, etc.)
      c. Research Questions:
         -Incidence of lime burning in region
         -Location of lime kilns
         -Persons involved in lime industry
         -Structures associated with lime burning: types, materials, forms, arrangement

E. Brickmaking
   1. Geographical: the Battle Mountain District

   2. Considerations:
      a. Time: the historic period
      b. Resources: brick yards, kilns, pug-mills (mixing)
      c. Research Questions:
         -Incidence of brickmaking in region
         -Factors influencing location
         -Principal markets
         -Brickmaking as industrial process
         -Kiln types

F. Salt
   1. Geographical: the Battle Mountain District

   2. Considerations:
      a. Time: the historic period
      b. Resources: evaporation pans, salt marshes, dwellings and outbuildings associated with salt production
      c. Research Questions:
         -Incidence of salt production
         -Factors influencing location
         -Markets
         -Methods
         -Persons participating in the industry

G. Mining

Geography and Time: Like agriculture, mining in central Nevada is a large and complex theme which surveys can approach from many directions. Given the large numbers of data available on mining, and the numerous cultural resources still extant, development of survey strategy and

focus will be crucial if field investigation and further research are to have meaningful results beyond simple accumulation of more information.

While the ultimate goal is to understand and evaluate mining and its associated physical remains in a District-wide (if not statewide) context, it will be most useful, logistically, to develop the overall survey in segments which will not only provide, individually, information about various aspects of the region's mining history, but also, when considered collectively, present a full story.

In all cases, investigation should be based on the concept of mining as a group of inextricably related phenomena: extraction, transportation, processing, and occupation of land for residential and commercial purposes incidental to mining activity. Thus, mines should be considered in relation to mills and transportation systems, and mining camps should be considered not as isolated instances of human settlement, but as simply one component of the mining phenomenon. Nearly all previous studies have viewed mining camps as individual expressions of colorful frontier life, springing up sui generis across the landscape. In fact, the only reason mining camps existed at all was to provide a place of residence and a source of goods and services for people locally engaged in extraction and processing of ore, and surveys that do not consider camps and towns in this context should not be conducted. The only exceptions to this rule will occur when specific elements of a camp or town are studied in connection with other themes, such as commerce or architecture, or when the subject is one of the principal towns (Eureka, Battle Mountain, Austin, Tonopah, and Belmont--see below). In sum: the basic unit of survey for mining, whether in the field or in the library, must be the mining district: mines, mills and other processing activities, transport systems and camps.

In order to develop an understanding of the evolution of mining techniques and patterns over time, one approach would be to group all the region's mining districts according to the last decade in which they were productive. Organization by last productive decade is useful because most physical remains of any mining district will date to the later period of operation, with many earlier remains either removed or obliterated by subsequent activity. If the districts can then be researched and inventoried chronologically (i.e. beginning with those productive only in the 1860's, and ending with those producing after WWI), the result should be a comprehensive inventory of historic resources that reflect the evolution of mining technology and methods through the entire historic period. If it is not feasible to survey all

mining districts at one go, one might select one district from each decade, inventory those, and develop predictive models for use in surveys of the rest, whether the latter surveys are systematic or project-specific.

Other strategies:

-A thematic survey and inventory of placer mining, concentrating on hydraulicking and gold dredging at Round Mountain, Manhattan and Battle Mountain;

-A survey and inventory of the Tybo-Hot Creek region, in which the mines and mills, charcoal industry, communities and adjacent ranches (for example, Dugan's and Page's ranches west of Hot Creek) are treated as closely-related parts of the whole. This area may form a coherent historic district in terms of time, place and relatedness of activities; although it covers a fairly large geographical area, it could be treated, in terms of the National Register, as a "discontinuous" district, rather than as an overly-large land area defined to encompass the outermost limits of the cultural resources associated with the historic district. If this in the end should prove unworkable, the area should be broken into two historic districts, Tybo and Hot Creek.

-Discovery of rich ore at Reese River in 1862 and on Mt. Oddie in 1900 not only resulted in the development of large mining districts at those places, but also fostered (generally with less success) mining in adjacent regions. Notable "spinoffs" from these major mining centers were (1) the intensive activity on both sides of the Toiyabe Range in the 1860's (including mines associated with Canyon City, Washington and San Juan on the west flank, and Clinton, Geneva, Guadalajara/Santa Fe, Kinston, Park Canyon, and Ophir on the east); and (2) the small boom in south-central Nye County, east of Tonopah, in 1900-1910 (including Hannapah, Ellendale, Clifford, Bellehelen, Silverbow and Golden Arrow). Thematic surveys of each of these areas would focus on the nature of small-scale mining in each period; results of each survey could then be compared to illustrate both changes and similarities in small-scale mining over a 40-year period.

-Given the loss and destruction of cultural resources associated with mining, both in the past and very probably in the future, some attempt should be made to identify and if possible protect well-preserved examples of these resources and systems. Although not ideal in terms of overall cultural resource management, protection priority should be given to areas with significant concentrations of historic mining resources, over those where mining resources are very few or have been extensively ravaged, if only to conserve a data

base for future survey. Areas with many, and generally intact, resources simply have more potential in terms of developing an understanding of mining technology and processes, and they should not be lost before they have been intensively studied and inventoried.

V. Architecture

Study of Nevada architecture has been limited to major population centers such as Las Vegas, Virginia City and Reno. National Register nominations for Austin, Eureka, Berlin and Ione have discussed structures in those towns, but not comprehensively nor with much attention to the buildings as architecture. The architecture of rural Nevada, with the exception of URS/Blume's 1977 survey, has been almost wholly neglected.

Priorities for survey of central Nevada's architectural resources are:

1. Inventory structure by structure, rather than simply listing "ranch" or "town" on an inventory form. The suggestions for a structure inventory form in Appendix C are made with this in mind.
2. Development of a typology for architectural resources, in terms of building types, materials, and methods of construction. The chapter of this Overview's historic narrative that deals with physical characteristics of ranch structures is written with the intention that it serve as a partial basis for such a typology.

Some considerations:

1. Begin with the assumption that all buildings and structures have at least potential interest as architecture. In other words, "Victorian gingerbread" houses or commercial blocks are not the only resources of architectural interest in central Nevada, and indeed constitute but a very small part of the region's architectural "universe." Rather, the architecture of central Nevada is characterized by imaginative and often ad hoc assembly of local materials, and survey and evaluation of the region's architectural resources should be conducted with this in mind.
2. Physical integrity is one of the basic criteria for National Register evaluation of all cultural resources. It is particularly important in evaluating architectural resources, because their significance rests solely upon their material characteristics, rather than partly on their associations, as is the case with "historic" resources. Thus the degree to which a structure retains physical integrity has a direct bearing on the significance of that structure, in terms of its being able to represent or illustrate a given architectural practice or form.

3. The character of structures associated with feeding, sheltering and otherwise caring for range livestock tends to alter but little over time and space, because there are only a limited number of ways to deal with a cow or a sheep. This continuity of form and use is a significant aspect of the architecture of agricultural structures. Residential structures, on the other hand, may exhibit much more variety over time and space, reflecting local, regional or national architectural trends, access to materials and artisans, different lifestyles (town vs. country), or, simply, changing attitudes toward what constitutes proper living space. In looking at residential architecture, one might consider:

a. Comparing rural residences with small town or camp dwellings, and with houses in major population centers. Are there noticeable differences in materials, size and form? To what degree are national trends reflected in the houses of each group, and how? Are population centers more susceptible to these trends than rural areas? (This sort of comparison must be done with care, because in many cases houses remaining in mining towns and camps are not representative of those communities' architecture as a whole. Historic photographs will provide important information in this regard, and should be considered basic research tools for any survey of central Nevada architecture--rural or urban.)

b. It might be possible to divide the region's architecture according to materials or construction methods: 1) "national," including fired brick, stone, "log cabin," box frame, balloon frame; and 2) "indigenous," including adobe brick, poured adobe, wattle and daub, and localized instances of stone and log (horizontal mass wall or vertical "palisade") construction. The latter category should also include dwellings built by Native Americans in the historic period (for example those of CrNV-06-949 near Big Cow Canyon Road in Nye Co.) and might even be extended to include prehistoric dwellings, since the focus of such a study would be functional manipulation of immediately available building materials.

4. Informed evaluation of central Nevada architecture will depend heavily upon having as much information as possible from which to make judgments, since to a large degree the evaluation will have to be made on the basis of comparison. The survey should try to identify buildings and structures that best represent or illustrate:

-use of materials
-construction methods
-forms or styles indigenous to the region, the Great Basin and the Southwest
-forms or styles derived from national or urban trends (often spread via builders' and architects' catalogs)
-widespread or characteristic forms of architecture
-unusual forms of architecture

-construction at various periods
-structure types, and varieties within each type
-work of a craftsman or artisan, for example a stonemason who built a number of buildings in a community or region

VI. Settlement/ Community: A Model for Investigation

There were basically three forms of "settlement" in central Nevada during the 19th and early 20th centuries: mining camps, towns, and agricultural occupation of the valleys and foothills. Mining camps were for the most part only incidental agents of settlement, in that people came to hitherto unpopulated places to live and work in them, but generally for but a very short time. Therefore, as noted in the discussion on mining surveys, camps should be studied as part of the "physical plant" of mining and its related activities, rather than as discrete units of settlement.

A handful of camps (Austin, Eureka, Tonopah, Battle Mountain and Belmont) developed into real communities (towns) through their association with very large, productive mining districts, location on major transportation routes, status as county seats, and role as service centers for outlying mining districts and agricultural communities. Austin, Eureka and Belmont are National Register Historic Districts, much of their 19th century character still observable. Battle Mountain, on the other hand, has lost many of its 19th century associations, due largely to its location on Interstate 80 and attendant modernization. Portions of Tonopah may be fairly well-preserved, because the town is more recent; a survey planned for summer, 1980, should result in identification of structures remaining from that town's historic settlement period.

Between the extremes of camp and major town are communities such as Tybo, Manhattan, Ione, and Round Mountain, which were longer-lived than most camps, but never achieved the size and impact of Battle Mountain, Austin, Eureka or Tonopah. Of these four towns, Ione is of interest chiefly as a former county seat; the other three are best studied in connection with their associated industrial/economic base (placer mining and dredging at Round Mountain and Manhattan, silver mining and charcoal burning at Tybo).

Apart from the townbuilders, the principal agents of settlement, as occupiers of land and developers of communities, were farmers, ranchers and their families. All too often it has been considered sufficient, particularly in a local context, to recognize the "first settler" and other "firsts", such as school, bank, store, house, etc. However, the act of being "first" was usually only a matter of historical accident, and such "firsts" may have in the long

run been irrelevant to the historical development of the locality or region. Knowing when the first settler came to a given locality is useful in tracing settlement patterns over a larger area. But settlement implies more than simple occupation of land by a single individual; it means establishment of social networks, recreation of community institutions in a new land, development of a subsistence base and evolution of land use and ownership patterns. Local settlement also does not occur in a vacuum: it is influenced by patterns of settlement over a whole region, by transportation systems, by economic factors, by the natural environment.

The basic unit of study of rural settlement in the Battle Mountain District is the valley. Valleys historically have held strong connotations of _place_ in the Far West, where towns were few and far apart, and counties too large and unpopulated to act as viable reference points for rural dwellers. This concept of the valley as _place_ is reinforced by topography. Each valley is to some extent isolated from other valleys by hills or mountains that act as physical and as psychological inhibitors of inter-valley social and economic intercourse. The fact that adjacent mountain ranges may have been swarming with mining activity did not _in the long run_ affect the valley as a definable place: mining camps had a different economic base, population structure and social organization, and were generally short-lived as well.

In selecting valleys for survey, it should be kept in mind that although mountain ranges provide the first definition, valleys are physically open at one or both ends, and where one valley opens into another the "boundary" of a valley community may shift over time, or be much less pronounced than boundaries formed by mountain ranges. Furthermore, the extreme length of some valleys may have encouraged establishment of more than one "community" within its confines. For example, Crescent, Little Fish Lake, Grass, Diamond and Hot Creek valleys are fairly well-defined units. Reese River, on the other hand, is divisible into two, the "boundary" between them being the Shoshone Range where it moves from the west to the east side of the valley. The northern end of Reese River would be oriented, historically, toward Battle Mountain, while the southern portion, surrounded by extensive mining activity, would have been oriented toward Austin. Big Smoky Valley as a settlement unit is reasonably definable down to its southern end, where below the Toiyabe Range it opens into confluence with the Ione Valley. The separation of the upper Big Smoky probably became particularly pronounced after 1900, due to the influence of Tonopah. Likewise Monitor Valley, which is fairly

closed at the southern end, but opens at the north into a "basin" formed by the confluence of Monitor, Kobeh and Antelope valleys. Antelope Valley in Lander County may not prove to be a discrete settlement unit, but rather an extension of the lower Reese River community.

Just as there was a definable pattern in the physical arrangement of buildings in mining camps, so also was there a pattern to the arrangement of living in the region's valleys. The camp/town pattern was basically concentric, though it varied according to topographical circumstances. At the center was the business district, with residential areas ringing the district, and industrial (mining) areas at the outer edge and extending up and back into the mountains (Fig. 4).

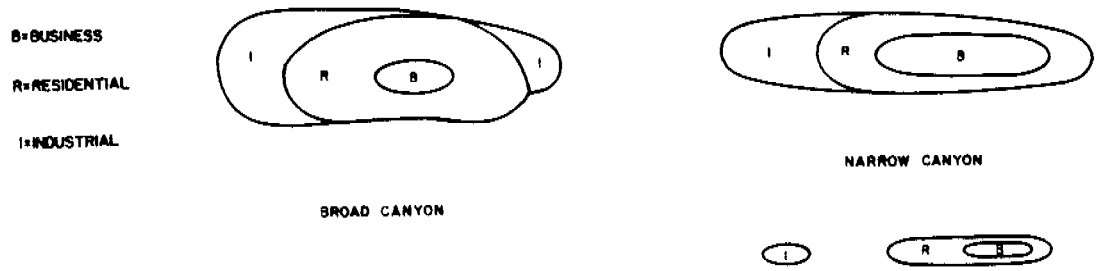


Figure 1: The Geography of Major Activities in Mining Camps

The camp/town pattern was not unique to central Nevada nor to the West, being rather an importation by the inhabitants from cities, towns and villages of the eastern and midwestern U.S., and rather forcibly imposed upon the mountain landscape. The valley pattern, however, could be considered more "indigenous," as it was based almost entirely upon location of water sources--mountain streams and springs--with wood and grazing as other important considerations. As a result, the valley settlement pattern generally consisted of individual ranches arranged along roads like widely-spaced knots on a string, one string running down each side of the valley. These two north-south roads were connected by others running across the valley, from one ranch to another. Occasionally one or more ranches were located toward the middle of the valley, at the intersection of several roads (Fig. 5).

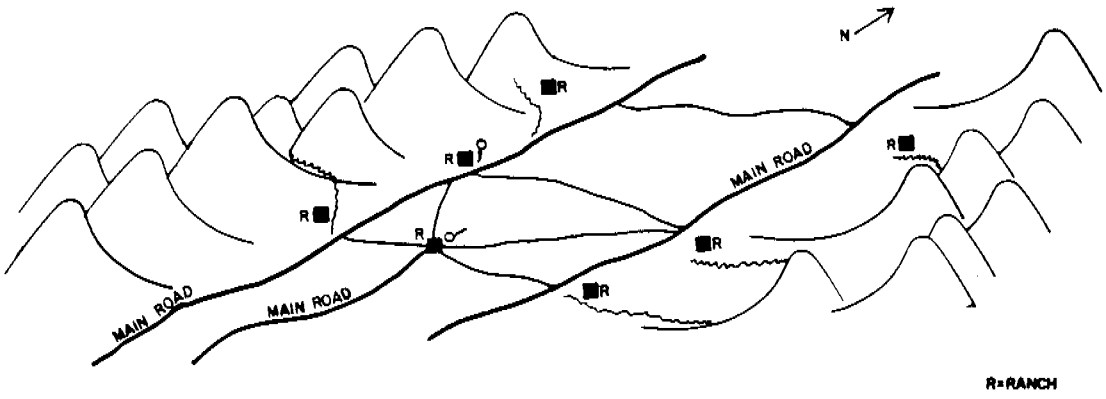


Figure 2: The Valley Settlement Pattern

Within the valley network, some roads were more "important," due chiefly to the amount of traffic on them. Since major transportation routes tended to follow the line of least resistance, nearly every valley had at least one segment of a longer route connecting widely-spaced towns or mining centers, the segment generally corresponding to one of the two north-south "strings." This correspondence, however, was neither inevitable nor invariable. At least two factors could influence the location of the valley's major road: location of way stations and occurrence of mining activity in the mountains to either side.

For example, the main road, with attendant station or stations, might at first run down the west side of the valley (Fig. 6A). In a few years, a rancher or would-be entrepreneur established a station on the east side of the valley, and the stage/freight route might then have moved to take advantage of new services (Fig. 6B). This move could be similarly effected by discovery of silver in the mountain range to the east (Fig. 6C).

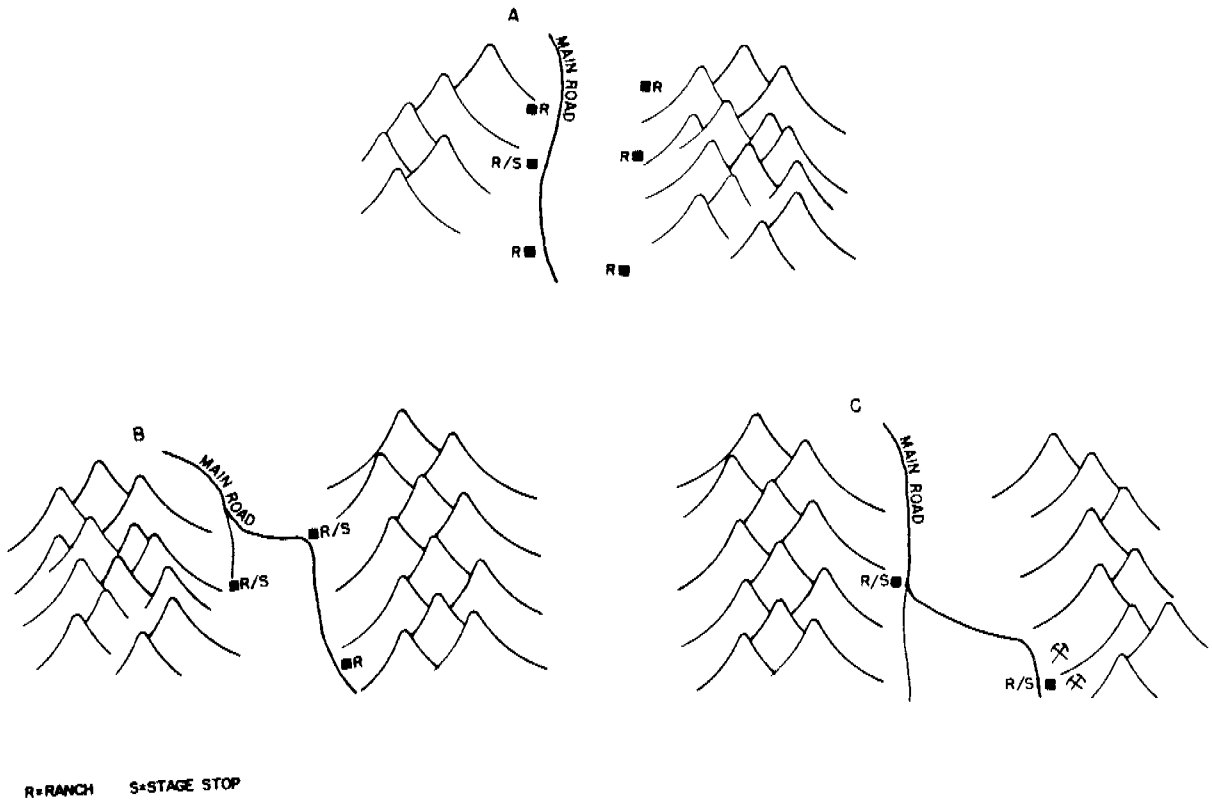


Figure 3: Main Transportation Routes: Location and Relocation

The three elements of valley settlement were thus the ranches, a major transportation route, and mining in the adjacent mountain ranges, to which valley dwellers related in different ways. The first, and generally most enduring, relationship was among the valley dwellers themselves, as neighbors bound to one another by geography, by their common lives as farmers and ranchers, as parents of school-age children, and perhaps eventually by marriage and family ties. The second relationship was with the route segment through the valley, along which stage and freight lines brought mail, occasional shipments of goods, and travellers from far and wide, allowing valley dwellers access to the outside world without the need for travel outside its confines. The third relationship was with population centers at one or both ends of the transportation segment running through the valley. This relationship was largely a commercial one, the town functioning as a market for ranchers' produce and as a supplier of valley dwellers' material goods. It could also be partly a social relationship, in that ranchers and families could go to town to vote, attend cultural events and festivities, and talk with the inhabitants

and with residents of other valleys who came to town on similar pursuits. Once established, this town-valley relationship remained fairly consistent over time, for example that between Diamond Valley and Eureka, Upper Reese River and Austin, lower Reese River and Battle Mountain, Monitor Valley and Belmont, Crescent Valley and Beowawe, Grass Valley and Austin. The first town-valley relationship for all residents of Big Smoky Valley would have been with Austin; a second relationship, much stronger in the south, developed with Tonopah after 1900.

These town/valley relationships were strong to the degree that a major population center was reasonably nearby, as in the examples listed above. They were most tenuous when major towns were reached only with some effort, as would have been the case from Ione, Hot Creek and Stone Cabin valleys, and Reveille and Ralston valleys before discovery of silver at Tonopah.

The fourth relationship, which either took the place of a strong town/valley connection or functioned along with it, was that between the valley and nearby mining camps. This was usually a series of relationships that changed over time as mining activity came and went. For example, Hot Creek Valley residents in the 1860's conducted business and social affairs with Hot Creek, but in the 1870's turned to Tybo. Residents of Big Smoky Valley supplied a series of small markets in camps such as Kingston, Geneva and Clinton in the 1860's and 1870's, but in the early 20th century turned their interests east to Round Mountain and Manhattan. In Ione Valley, Ione, Union Grantsville and Ellsworth offered markets to local ranchers in the 1860's and 1870's, as did Berlin in the 1890's.

These four relationships should be definable in the survey of any valley settlement, although there will be variations due to geographical factors, presence or lack of railroads, and the vagaries of mining history in the region. (For example, upper Reese River Valley experienced significant concentrations of both mining and agricultural activity in the 1860's and 1870's. The surrounding mountains were the focus of much early mining exploration, and the Reese River, largest water source south of the Humboldt, offered opportunities for irrigation and settlement to a degree not possible in most other valleys of the region.) Identification of these relationships results in a strong basis for cultural resource survey of rural settlement in central Nevada, because it establishes the temporal, geographic, economic and social context within which the physical expressions of that settlement can be studied and evaluated.

Once the four relationships have been described, the next step is to place physical resources within the context thus established, and to evaluate these resources in terms of their role in, and ability to represent, various aspects of valley settlement history and development.

Within the valley, list:

-Ranches that date from the first 5-10 years of settlement; these will have set the basic physical arrangement of living in the valley;
-The major route through the valley, including any changes in the route over time;
-Stations along that route, original and subsequent;
-Location of post offices, and dates of operation;
-Location of schools, and dates of operation;
-Ranches owned by one family over many years; such families provide continuity in the midst of temporal, economic and social change;
-"Big" ranches: those with the most livestock; such ranches, by virtue of their size, may have set a pattern for agricultural activity, and their owners may have become prominent social or political figures in the valley.

By mapping the sites in terms of both function and time, it will be possible to identify focal points within each valley community, and to see if they change (both in kind and in location) over time. The potentially most significant sites will be those that occur most frequently in the lists. This frequency will vary from valley to valley (and the reasons for such variation are worth investigation). For example, one or two ranches in one valley may have been foci from the beginning of settlement, while in another valley the foci may have moved over time, or have been numerous but relatively weak.

Once this phase is completed, sites identified as valley focal points must be examined in the field to ascertain their integrity. This integrity is basically defined as the ability of a site or sites to convey feelings of time, place and association with those events, activities or people being recognized in the survey as contributing to the historic character and development of settlement and community life in the valley. For example, a ranch on which all buildings but a few mud and log sheds are of mid-20th century vintage is no longer eligible for nomination to the National Register as an 1870's stage station and post office. Nor do a group of stone walls adequately represent the life of the valley's leading rancher, long-time inhabitant and school district clerk. In evaluating integrity, remember

also that the basic living unit was the ranch, dwelling, barn, outbuildings, corrals, and not simply a house by itself. Thus where possible all structures on a ranch dating from the time of the event, activity and/or person being recognized should be included in the survey and nomination.

* * *

Participation of various nationalities in the historical development of central Nevada can, at least in part, be studied in the rural settlement context, as the historic narrative section of this Overview has briefly demonstrated. Using a combination of census records, tax rolls, and the early township survey maps, it is often possible to associate persons of various national origins with specific ranches and valleys, thus creating a vehicle for recognition of the region's ethnic diversity. This recognition is not limited to participation in agricultural settlement, of course, but the role of nationalities in other aspects of central Nevada history is better studied in other contexts. Examples include the Chinese in railroad construction, as miners in some districts and as participants in the economy of other camps and towns; the Swiss and Italians in the charcoal industry; Germans as brewers and businessmen; Basques in agriculture.

In the rural settlement context, study questions might include:

-What was the ethnic composition of the valley in the early settlement years?
-How did this composition change over time? Why?
-Are some nationality groups more numerous than others?
-Does the presence of a "dominant" nationality group color the way of life or society of the valley?

A NOTE ON HISTORICAL SOURCES

A great deal of information is available on the history of central Nevada in government records, university libraries, the state historical society, collections outside Nevada (principally in California) and in published materials. Some materials have been used extensively by others studying the region (for example, Angel's 1881 History of Nevada) but many more have not been fully appreciated.

The historian's task in conducting research is twofold: deciding what sources to use, and how. Several factors condition the approach, among them the purpose and scope of the research, and the time available in which to accomplish it. In preparing this study for the BLM-Battle Mountain District, one of the investigators' purposes was to present an overview, arranged around major themes, that would serve as context for interpretation of individual historical and architectural resources. To this end, they consulted many kinds of historical materials, from published secondary sources to newspapers and manuscript census population schedules. In many cases, they found secondary sources quite valuable, offering insights and information heretofore untapped by previous researchers. On the other hand, many primary sources, such as letters, diaries, account books, etc. were found to be either unhelpful or too narrowly focused to contribute much to a broad-based cultural resources overview.

Nevertheless, a "core" of sources was soon identified as the most basic research tool for this study. Many still have not been fully exploited, and they deserve consideration in future investigation of central Nevada's history and cultural remains.

As mentioned above, Angel (1881) is and has been an important reference on 19th century Nevada history. Although factual errors are sometimes evident, and the presentation is somewhat skewed toward the promotional, Angel's book contains an enormous amount of information about life and enterprise during the state's first two decades. It is thus an excellent starting point for study.

Other contemporary sources of utmost importance are census records, tax records, township survey maps and local newspapers. Population schedules from state and federal censuses provide data on people: names, occupations, national origins, family size, and to a limited extent, location. They can be used in conjunction with county tax records to study settlement (even down to individual

ranches), immigration, and the region's commerce and industry. Township survey maps provide information on transportation systems, settlement and land use, and have been invaluable in the present study. However, they vary in date from the 1860's until well into the 20th century, and thus cannot present a complete picture for any one time period. Also, mountain regions were seldom surveyed, so much information on mining camps and other mountain-based activities is not shown on these maps. Contemporary newspapers are crucial in the study of local history, but some are more useful than others. Some, for instance the Eureka Sentinel, concentrate on local mining, to the exclusion of much else occurring in the community. Others are more broad-based, and thus particularly useful. One of the best is the Reese River Reveille, which covered people and events in many areas of central Nevada. The advertising sections also provide valuable data on local commerce and business establishments. City directories (often published as statewide or regional directories) are also useful for study of commerce.

Annual or biennial reports of Nevada state offices are rich sources of information on many topics. Reports from the Secretary of State include lists of incorporations filed each year in the state, most of course being mining companies. However, the lists are in order of filing date, rather than geographical location, which makes them somewhat difficult to use. Reports from the Superintendent of Public Instruction, particularly after 1887, list school districts, clerks and teachers, and have been of particular use in studying rural settlement and community institutions. The Surveyor General's reports, beginning in 1865, include annual statistics, by county, for industry, agricultural production, etc. Many also contain reports from county assessors enlarging upon the statistics and discussing various aspects of settlement and economic activity. Reports from the State Engineer (beginning 1903) include lists of persons applying for irrigation permits. These are not, however, arranged by county, and often the only locational information is the name of the creek from which the applicant wished to draw water. The proposed use of water is listed in each case, suggesting that these records might be useful in future study of land use and agricultural activity. Finally, reports of the Commissioner of Labor, although not begun until 1915, contain information on union activities and the overall condition of employment in the state.

Nineteenth century exploration in central Nevada is covered in many sources. Goetzmann (1966) discusses exploration in the context of the entire west, while Cline (1963) concentrates on exploration in the Great Basin.

Because most exploration in central Nevada was under government auspices, records are many and detailed. The "Notes on Sources" in Goetzmann (1966) is an excellent starting point for future study of this topic. Among the major collections of the National Archives are Record Groups 48 and 57 (Department of Interior, including Geological Survey) and 77 (Topographical Engineers).

Sources for study of central Nevada's native populations in the historic period are rather limited. Correspondence and records of the U.S. Office of Indian Affairs, and records of the U.S. Army in Nevada form the basic primary documentation on the subject. Census records contain information on location of native populations, and often cite occupation as well. Occasionally local newspapers mention Indian inhabitants; although the references are usually derogatory, they do provide insight into the role of native populations in various local communities. Publications of the Inter-Tribal Council of Nevada (1976a,b,c, 1978) are useful and interesting references, as is Forbes (1967, 1969). Ethnographic studies of Great Basin peoples include Steward (1941, 1958), Stewart (1941) and Kroeber (1939).

Other ethnic groups have received varying treatment. Shepperson (1970) provides a general overview of immigration and the immigrant experience in Nevada. Italians have been studied by Grazeola (1969), and Earl (1969), the Chinese by Carter (1975) and Basques by Douglass (1970), Georgetta (1965, 1972), Sawyer (1971) and Shepperson (1970), but most other immigrant groups have not received attention, except in passing. One source not tapped in the present study is the special collection on Basque studies at the University of Nevada, Reno.

The history of the region's railroads is detailed in Myrick (1962, 1963), and Goodwin (1966) provides additional material on the northern roads. Further study of rail transportation in central Nevada should include examination of business records from the Nevada Central, Eureka-Palisade and Tonopah-Goldfield railroads, many of which are available at the Nevada Historical Society, and also contemporary newspapers, particularly those from Austin, Eureka, Battle Mountain and Tonopah.

Among the best sources for the study of toll roads, and freight and stage lines are contemporary maps, biennial reports of the state legislature (for toll franchises), city directories and local newspapers. Hafen (1926) gives a good account of the Overland Mail, and Lass (1972) provides context for historical development of western freighting, although his emphasis is on the region east of Salt Lake City.

One of the more interesting descriptions of life along the Pony Express trail is included in Richard Burton's 1860 City of the Saints (excerpts reprinted in 1960 by the Nevada Historical Society Quarterly), and includes useful information on the stations themselves.

Although few individual articles have been written specifically about agriculture in central Nevada, there is a wealth of material on the state as a whole that includes information about this particular region. Perhaps the best study of the western range livestock industry is Clawson (1950). Of great value are the many publications of the University of Nevada Agricultural Experiment Station (Reno), particularly Brennen (1935), Carpenter et al (1941), Fleming and Brennen (1937, 1940), and Hardman and Mason (1949). Creel (1964) and Hazeltine et al (1961) have also proved useful to the present study. The most recent work on mustanging is Thomas (1979), which traces the wild horse problem and efforts (private and governmental) to deal with it from the 19th century to the present. The question of public range management in the West is thoughtfully treated in Adams (1926), which discusses the situation prevailing in the early 20th century and offers recommendations that to a great extent were adopted with the Taylor Grazing Act and later organization of the Bureau of Land Management. Clawson (1950) also has several informative chapters on this subject. Further study of agriculture in central Nevada should include detailed examination of census and county tax records. Nineteenth century county assessors' reports (published through the State Surveyor General) also contain information about crops and livestock.

The settlement history of central Nevada has received little scholarly attention. Good places to start are the county histories of Berg (1942), Fleischmann (1967) and King (1954). Again, census population schedules and county tax records will be important sources of information, as are the 19th century township survey maps. Further examination of school district organization (through published reports and, if available, local records) may also shed light on settlement patterns in the region.

Study of central Nevada's architecture will have to begin with the buildings and structures themselves. For buildings in larger towns a good beginning reference is Stoehr's (1975) book on Colorado mining towns. Among the growing number of "style" books, Foley (1980) and Rifkind (1980) are very good, being somewhat broader than others such as Blumenson (1977) or Whiffen (1969). Concerning the region's rural architecture, there is almost nothing to be had, as most publications on this topic deal with states and

regions east of the Mississippi River. This trend is changing, however, as demonstrated by the Minnesota Historical Society's Minnesota Farmscape: Looking at Change (1980). It might be worthwhile to consult State Historic Preservation Offices in states such as Colorado, Montana, Texas, Wyoming, Utah, Idaho, New Mexico and Arizona to determine if they have studied rural architecture and if so how. Published inventories or reports from these states might also help to put central Nevada's architectural resources in regional perspective.

There is an enormous amount of information on the mining West. The question is how to use it. Any further study of mining in central Nevada should begin with Paul (1963) and Smith (1967), to obtain an overview of western mining and Nevada's place within that theme. For specifics, Couch and Carpenter (1943) and Lincoln (1923) have long been recognized as invaluable. For study of Round Mountain, Manhattan and Natomas, Spence (1980) presents a good account of gold dredging in the west. The Barnett collection (with accompanying text) at the Nevada Historical Society contains an extraordinarily fine selection of photographs on hydraulicking at Round Mountain. Oberbillig (1967) has written a useful, and well illustrated description of the Washoe and Reese River processes, Vanderburg (1936) gives a good account of placer mining in the state, and Nolan (1962) is a good recent study of Eureka.

Contemporary newspapers provide much detail about mining and mining enterprises; because they were written in large part to lure prospective investors, however, they should be used with extreme care. Among the best sources of information about mining structures are contemporary photographs, of which the Nevada Historical Society has a very fine collection. These photographs will show the kinds of structures originally present at mining and milling sites, and help future researchers to identify mining remains in the field.

Perhaps the most reliable source of information on Nevada mining in the 19th and early 20th centuries is the professionally-prepared series Mineral Resources West of the Rocky Mountains, issued by the U.S. Treasury Department beginning in 1866. They are variously titled, and were prepared by several authors, for example J. Ross Browne in 1866-1867, Rossiter W. Raymond 1868-1875, and for a period (1882-1893) were issued as part of annual reports from the U.S. Geological Survey. The best way to locate these reports is through the Checklist of U.S. Public Documents, issued by the Superintendent of Documents.

BIBLIOGRAPHY

Adams, Ramon F.
1959 The Rampaging Herd: A Bibliography of Books and Pamphlets on Men and Events in the Cattle Country. Norman: University of Oklahoma Press.

Adams, Romanzo C.
1916 Public Range Lands--A New Policy Needed. American Journal of Sociology 22: 324-351.

Adelberg & Raymond.
1865 Report on the History and Potential of the Nye County, Nevada Area. . . . Nevada Historical Society.

Allardt, G. F.
1863 Topographical Map of Reese River Mines and Town of Austin, Nevada Historical Society.

Allen, Lemuel.
1903 Letter, 11 November 1903, concerning expulsion of Chinese from Tonopah, Nevada Historical Society.

Allen, Robert A.
Papers. Nevada Historical Society.

Amonette, Hazel.
n.d. A True Story of Eureka. Ms., Nevada Historical Society.

Ancient Order of Hibernians, Austin.
Records. Nevada Historical Society.

Angel, Myron (ed.).
1881 History of Nevada, with Illustrations and Biographical Sketches of its Prominent Men and Pioneers. Oakland, Calif.: Thompson and West.

Angus, Ina Miller.
n.d. Toll Roads of Western Nevada. Ms., Nevada Historical Society.

Arndt, Karl J. R., and May E. Olson.
1961 Nevada. German-American Newspapers and Periodicals, 1732-1955. Heidelberg: Quelle and Meyer: 298-9.

Ashbaugh, Don.
1963 Nevada's Turbulent Yesterday . . . A Study in Ghost Towns. Los Angeles: Westernlore.

Austin Consolidated Silver Mines Co., Ltd.
Records 1865-1867. Berkeley.

Austin Literary Association.
Records 1878-1880. Nevada Historical Society.

Austin Manhattan Consolidated Mining Co.
1908 Report on condition and prospects, 14 June 1908. Nevada Historical Society.

Austin Meat Co., Austin Nev.
Ledger, 1 November 1908-July 1914. University of Nevada, Reno.

Bailey, E. H. and D. A. Phoenix.
1944 Quicksilver Deposits in Nevada. University of Nevada Bulletin 38.

Bancroft, Hubert Howe.
1890 History of Nevada, Colorado and Wyoming, 1540-1888. San Francisco: The History Company.

Barnes, William C.
1913 Western Grazing Grounds and Forest Ranges: A History of the Livestock Industry as Conducted on the Open Ranges of the Arid West. Chicago: Breeder's Gazette.

Barnett, George L.
1969 Hydraulic Mining at Round Mountain. Typed booklet, to accompany Barnett collection of photographs. Nevada Historical Society.

Barrenchea, Melody.
1961 Basques in Nevada. Ms., Nevada Historical Society.

Battle Mountain Mining Co., USA, Ltd.
Records 1869-1879. Berkeley.

Beach, Rex.
1907 Fight at Tonopah. Everybody's Magazine 16: 464-474.

BeDunnah, Gary P.
1966 A History of the Chinese in Nevada: 1855-1904. Unpublished M.A. Thesis, University of Nevada, Reno.

Beebe, Lucius M. and Charles M. Clegg.
1949 U.S. West: The Saga of Wells Fargo. New York: Dutton.

Behm, Anthony J.
n.d. A Story of Growth--Austin 1863. Ms., Nevada Historical Society.

Belaustegui, Delphine.
1931 The True History of My Community. Ms., Nevada Historical Society.

Belmont, Nevada: A Calico Print Folio, in Calico Print 8:
1952 13-24.

Bender, D. A.
Scrapbook, Carson City 1875-1881. Bancroft.

Benjamin, Israel Joseph.
1956 Israelites in Nevada, in Three Years in America, 1859-1862. Philadelphia: Jewish Publication Society of America, Vol. II: 206-221.

Berg, Lucile R.
1942 A History of the Tonopah Area and Adjacent Region of Central Nevada, 1827-1941. Unpublished M.A. Thesis, University of Nevada, Reno.

Berlin Miners' Union.
1902 Letter, 25 June 1902. Nevada Historical Society.

Bianchi, Ron.
n.d. Biography of Miss Eliza Pierce of Battle Mountain, Nevada. Nevada Historical Society.

Blatchly, A.
1867 Mining and Milling in the Reese River Region of Central and Southeastern Nevada. New York: Slate and Jones.

Blatchly, A. et. al.
1865 The Silver Districts of Nevada. New York: William C. Bryant & Co., printers.

Bleak, Hames Godson.
n.d. Annals of the Southern Utah Mission 1847-1900. Ms., Bancroft.

Blossom, John Ansel.
n.d. Battle Mountain Nevada. Ms., Bancroft.

Blumenson, John J.-G.
1977 Identifying American Architecture: A Pictorial Guide to Styles and Terms, 1600-1945. Nashville: American Association for State and Local History.

Boak, Cada Castolas.
Correspondence and Papers, 1902-1908. Nevada Historical Society.

Boni, Mary.
n.d. Historic Landmarks in My Vicinity. Ms., Nevada Historical Society.

Bonwick, James.
1872 The Mormons and the Silver Mines. London: Hodder and Stoughton.

Bowles, Samuel.
1865 Across the Continent. Springfield, Mass.: Samuel Bowles & Co.

Brackett, A. G.
1869 Nevada and the Silver Mines. The Western Monthly 1:235.

Bradford and Bradford.
1905 Map of Tonopah Mining District. University of Nevada, Reno.

Bradley, Lewis Rice.
n.d. Biographical Notes. Ms., Bancroft.

Bradley, Thelma.
1959 Episcopal Churches in Nevada. Ms., (includes research notes), Nevada Historical Society.

Brayer, Herbert O.
1949 The Influence of British Capital on the Western Range-Cattle Industry. Tasks of Economic History, Supplement IX.

Brennen, C. A.
1935 The Public Range and the Livestock Industry of Nevada. University of Nevada Agricultural Experiment Station Bulletin #139.

Burkhart, J. A.
1952 The Frontier Merchant and Social History. Montana Magazine of History 2:5-15.

British Nevada Syndicate, Ltd.
Records 1907-1946. Bancroft.

Brown, Harold Nicholas.
1935 History of Elementary Education in Nevada, 1861-1934. Ed.D. Dissertation, University of California, Berkeley.

Brown, Mark H. and W. R. Felton.
1956 Before Barbed Wire. New York: Holt, Rinehart & Winston.

Brown, Ronald.
1975 A Social History of Hard Rock Mining. Ph.D. Dissertation, University of Illinois, Urbana.

Browne, Howard E.
1918 The Political Township in Nevada. Monograph, Nevada Historical Society.

Browne, J. Ross.
1866 Reese River Country. Harper's Monthly Magazine 33: 26-44.

Browne, J. Ross.
1867 A Report on the Mineral Resources of the States and Territories West of the Rocky Mountains [for the year 1866]. Washington: Government Printing Office.

Browne, J. Ross.
1868 Mineral Resources of the States and Territories West of the Rocky Mountains [for the year 1867]. Washington: Government Printing Office.

Browne, Lina Fergusson (ed.).
1969 J. Ross Browne: His Letters, Journals and Writings. Albuquerque: University of New Mexico Press.

Bruner, Evelyn.
1961 History of Ione Valley. Ms., Nevada Historical Society.

Burgess, J. A.
1909 The Geology of the Producing Part of the Tonopah Mining District. Economic Geology 4: 681-712.

Burton, Sir Richard.
1960 Excerpt from City of the Saints, in Nevada Historical Quarterly 3(2): 7-35.

Carlson, Helen Swisher.
1959 Nevada Place Names: Origin and Meaning. Ph.D. Dissertation, University of New Mexico, Albuquerque.

Carpenter, G. Alvin, Marion Clawson and C. E. Fleming.
1941 Ranch Organization and Operation in Northeastern Nevada. University of Nevada Agricultural Experiment Station Bulletin 156.

Carpenter, Jay A., et al.
1953 The History of 50 Years of Mining at Tonopah, 1900-1950. University of Nevada Geology and Mining Series 51.

Carter, Gregg Lee.
1975 Social Demography of the Chinese in Nevada: 1870-1880. Nevada Historical Society Quarterly 18: 72-89.

Central Pacific Railroad.
1875 Railroad Lands in California, Nevada and Utah. San Francisco. Bancroft.

Charles Hall Page & Associates, Inc.
1978 Procedures Manual for Compiling a Statewide Inventory of Cultural Resources. Prepared for the Nevada Department of Conservation and National Resources, and the Division of Historic Preservation and Archaeology.

Charter Oak and Corn Exchange Claims, Lander County.
1865 Report. Nevada Historical Society.

Clark, Walter Van Tilburg (ed.).
1973 The Journals of Alfred Doten, 1849-1903. Reno: University of Nevada Press.

Clawson, Marion.
1950 The Western Range Livestock Industry. New York: McGraw-Hill.

Cleland, Robert G.
1950 This Reckless Breed of Men: The Trappers and Fur Traders of the Southwest. New York:

Clifford, Susan.
1959 Tonopah, Ellendale, and Clifford. Ms., Nevada Historical Society.

Cline, Gloria Griffin.
1963 Exploring the Great Basin. Norman: University of Oklahoma Press.

Cochran, Chester.
n.d. An Old Settler's Story of Manhattan, Nevada. Ms., Nevada Historical Society.

Cogswell, William W.
Business Records and Correspondence, 1908-1923. Nevada Historical Society.

Comfort, H. G. (comp.)
1941 Camera Shots of Ghost Cities of California and Nevada. Photos by Bill Rogers. Shafter, Calif.: Shafter Press.

Connor, L. G.
1921 A Brief History of the Sheep Industry in the U.S. American Historical Association Annual Report for 1918. Washington, D.C.

Cornwell, H. R.
1972 Geology and Mineral Deposits of Southern Nye County, Nevada. Nevada Bureau of Mines and Geology, Bulletin 77.

Cortez Mines, Ltd.
Records 1888-1896. Bancroft.

Couch, Bertrand F. and Jay A. Carpenter.
1943 Nevada's Metal and Mineral Production (1859-1940, Inclusive). University of Nevada Geology and Mining Series 38.

Creel, Cecil W.
1927 Agricultural Nevada. Nevada Newsletter 21: 69-70, 93, 95, 98.

Creel, Cecil.
1964 History of Agriculture in Nevada. Max C. Fleishmann College of Agriculture, University of Nevada, Reno.

Crofut, Andrew D.
1970 Diamond Valley Dust. University of Nevada Oral History Project, Reno.

Dale, Edward E.
1960 The Range Cattle Industry. Norman: University of Oklahoma Press.

Dana, Samuel T.
1956 Forest and Range Policy: Its Development in the United States. New York: McGraw-Hill.

Danhof, Ralph H.
1943 The Accommodation and Integration of Conflicting Cultures in a Newly Established Community. American Journal of Sociology 49: 14-23.

Davis, Samuel P. (ed.).
1913 The History of Nevada. Reno: Elms Publishing Co.

Delvaille, G. C.
1954 A Brochure Depicting the Deterioration of the Business Activity of the Nevada Division of the California Electric Power Company. Nevada Historical Society.

Dennett, Muessig & Associates, Ltd.
1979 Historical and Architectural Descriptions of Selected Sites in and around Montour, Idaho. Report prepared for U.S. Department of the Interior, Bureau of Reclamation, Boise, Idaho.

Dieringer Family.
Papers, 1884-1940. Nevada Historical Society.

Dinsmore Brothers.
Business Papers, Austin, Nevada, 1869-1874. Bancroft.

Dobie, J. Frank.
1934 The Mustangs. Boston: Little, Brown.

Doten, Alfred.
Diaries and Papers 1849-1903. University of Nevada (Includes photographs).

Douglass, William A.
1970 The Basques of the American West: Preliminary Historical Perspectives. Nevada Historical Society Quarterly 13 (4): 12-25.

Earl, Phillip I.
1969 Nevada's Italian War. Nevada Historical Society Quarterly 12 (2): 47-87.

Eitel, Edward D.
1909 County Atlas of California and Nevada. San Francisco. Bancroft.

Elliott, Russell R.
1973 History of Nevada. Lincoln: University of Nebraska Press.

Elliott, Russell R.
1965 Nevada's 20th Century Mining Boom: Tonopah-Goldfield-Ely. Carson City: University of Nevada Press.

Emmons, William H.
1910 A Reconnaissance of Some Mining Camps in Elko, Lander and Eureka Counties, Nevada. U.S.G.S. Bulletin #408. Washington, D.C.: Government Printing Office.

Ericson, Robert Edward.
1970 Touring Entertainment in Nevada during the Peak Years of the Mining Boom, 187_-1878. Ph.D. Dissertation, University of Oregon, Eugene.

Eureka Nevada Railway Co.
Daily Service Record, 1936. Bancroft.

Eureka Nevada Silver Mining Co., Ltd.
Records 1880-1905. Bancroft.

Eureka and Palisade Railroad.
Records 1873-1938. University of Nevada.

Eureka County, Nevada, Assessor.
Assessment Rolls, 1891-1892. Nevada State Archives.

Eureka People Place Great Faith in Ruby Hill Mines.
1950 Nevada Highways and Parks 10: 22-31.

Ewing, Dana.
1959 Tonopah. Ms., Photos., Nevada Historical Society.

Extinct Towns.
1953 Nevada Highways and Parks 1: 26-31.

Farrell, Michael Joseph.
1885 Letters, Austin, Nevada. Bancroft.

Farish, John B.
1910 Report on the Properties of the Tybo Consolidated Mining Co, October 24, 1910. Nevada Historical Society.

Ferguson, Henry G.
1929 Mining Districts of Nevada. Economic Geology 24: 115-148.

Fife, A. E. and J. M. Fife.
1948 Hay Derricks of the Great Basin and Upper Snake River Valley. Western Folklore 7(3): 225-239.

Fife, William.
1912 The Ownership of Nevada Land. Incomplete M.A. thesis, Nevada Historical Society.

Finlay, John.
1903 Tonopah. Overland Monthly 41: 69-74.

Fleming, C. E. and C. A. Brennen.
1937 Studies of the Range Sheep Business in Nevada. University of Nevada Agricultural Experiment Station Bulletin #145.

Fleming, Charles E. and C. A. Brennen.
1940 Range Sheep Production in Northeastern Nevada; Production and Earning Power 1933-1938; Inclusive Long-Time Situation, 1910-1938. University of Nevada Agricultural Experiment Station Bulletin #151.

Fletcher, Fred Nathaniel.
1917 The Trappers and Explorers of the Great Basin. Nevada Historical Society Papers 2: 208-232.

Foley, Mary Mix.
1980 The American House. New York: Harper and Row.

Forbes, Jack D. (ed.).
1967 Nevada Indians Speak. Reno: University of Nevada Press.

Forbes, Jack D.
1969 Native Americans of California and Nevada. Healdsburg, California: Naturegraph Publications.

Forbes-Lindsay, Charles Harcourt.
1908 Reclaiming the Desert: The Transformation of Arid Lands into Farms and Homes. Craftsman 15: 573-584.

Force, Edwin Truesdell.
1933 The Counties of Nevada: Organization and Significance, 1849-1873. Unpublished M.A. Thesis, University of California, Berkeley.

Francis, W. G.
1909- Business Records, Austin.

Freemasons, Belmont, Nevada.
Records 1873-1880. Nevada Historical Society.

Frickstad, Walter Nettleton, and Edward W. Thrall.
1958 A Century of Nevada Post Offices, 1852-1957. Oakland, Calif.: Pacific Rotaprinting Co.

Frink, Maurice, et. al.
1956 When Grass Was King: Contributions to the Study of the Range Cattle Industry. Boulder: University of Colorado.

Gabbs.
1955 Nevada Highways and Parks 15: 28-31.

Gaw, Robert B.
1956 A Study of Problems Arising from the Transition from Local School Districts in the State of Nevada. Unpublished M.A. Thesis, University of Nevada, Reno.

Gayer, James.
n.d. Historic Landmarks, Old National. Ms. Nevada Historical Society.

Georgetta, Clel.
1965 Sheep in Nevada. Nevada Historical Society Quarterly 8: 14-38.

Georgetta, Clel.
1972 Golden Fleece in Nevada. Reno: Venture Publishing Co., Ltd.

Gianella, Vincent P.
1945 Bibliography of Geologic Literature of Nevada. University of Nevada Bulletin 39(6).

Gillis, William R. (comp.)
1868 The Nevada Directory for 1868-69. San Francisco: M. D. Carr and Co., printers.

Gilluly, James and Harold Masursky.
1965 Geology of the Cortez Quadrangle, Nevada, in D. R. Mabey, Gravity and Aeromagnetic Surveys. U.S. Geological Survey Bulletin 1175.

Glass, Mary Ellen.
1964 Water for Nevada: The Reclamation Controversy, 1885-1902. Reno: University of Nevada Press.

Glass, Mary Ellen.
1969 Silver and Politics in Nevada, 1852-1902. Reno: University of Nevada Press.

Goetzmann, William H.
1966 Exploration and Empire: The Explorer and Scientist in the Winning of the West. New York: Vintage Books.

Gold Canyon Mining District.
Records 1863-1906. Nevada Historical Society.

Goodwin, V. O.
1966 The Humboldt-Nevada's Desert River and Thoroughfare of the American West. U.S. Department of Agriculture--Nevada. Humboldt River Basin Survey.

Gray, R. Guild.
1948 Public School Finance in Nevada. M.A. Thesis, University of Nevada, Reno.

Grazeola, Franklin.
1969 The Charcoal Burners' War of 1879: A Study of the Italian Immigrant in Nevada. M.A. Thesis, University of Nevada, Reno.

Greever, William S.
1963 The Bonanza West. Norman: University of Oklahoma Press.

Grey, Jessie.
Letters, 1889-1891. Nevada Historical Society.

Guisti, Frank.
Belmont. Ms., Nevada Historical Society.

Hafen, LeRoy.
1926 The Overland Mail. Cleveland: A. H. Clark.

Hague, James D.
1870 Mining Industry. Volume 3 of Clarence King (ed.) United States Geological Exploration of the Fortieth Parallel. Washington, D.C.: The War Department, Professional Papers 18. U.S. Government Printing Office.

Hamlin, Alfred Street.
1919 The Federal Policy in Relation to the Nevada Indian. M.A. Thesis, University of California, Berkeley.

Hancock, John.
1909 Mining and Other Resources of Eureka County, Nevada. Nevada Historical Society.

Hardmann, George and Howard G. Mason.
1949 Irrigated Lands of Nevada. University of Nevada Agricultural Experiment Station Bulletin #183.

Harrington's Directory of the City of Austin . . . with a
1866 Historical and Statistical Review of Austin and the Reese River Mining District by Myron Angel. Austin: [W. P. Harrington].

Harris, Elmer B.
1907 The New West: A Social Study of Life in Nevada Towns Today. Sunset 18: 296-298.

Hazeltine, B., C. Saulisberry and H. Taylor.
1961 A Range History of Nevada. American Society of Range Management, Nevada Section. Annual Meeting, Salt Lake City, Utah.

Hedrick, Harry.
1906 The Newest Manhattan. Sunset 17: 258-262.

Henriques, (The Rev.) Hoyt E.
Diaries, 1907-1943. Nevada Historical Society.

Hill, James M.
1912 The Mining Districts of the Western United States. U.S. Geological Survey Bulletin 507.

Hill, James M.
1915 Some Mining Districts in Northeastern California and Northwestern Nevada. U.S. Geological Survey Bulletin 594.

Historical Records Survey.
1941 Inventory of the Church Archives of Nevada: Protestant Episcopal Church. Reno: Historical Records Survey.

Historical Records Survey.
1939 Inventory of the Church Archives of Nevada: Roman Catholic Church. Reno: Historical Records Survey.

Hodge, Frederick W. (ed.)
1912 Handbook of American Indians North of Mexico (2 Vols.). Washington, D.C.

Holderman, Orville.
1963 Jewett W. Adams and W. N. McGill: Their Lives and Ranching Empire. M.A. Thesis, University of Nevada, Reno.

Hood, William Henry.
Medical Notebook, business records, etc. from practice in Battle Mountain. Nevada Historical Society.

Horton, R. C.
1963 An Inventory of Barite Occurrence in Nevada. Nevada Bureau of Mines and Geology 4.

Horton, R. C.
1962 An Inventory of Fluorspar Occurrences in Nevada. Nevada Bureau of Mines and Geology 1.

Houghton, Ruth M. and Leontine Nappe (eds.)
1977 Nevada Lifestyles and Lands. Reno: Bureau of Governmental Research, University of Nevada.

Huffaker, Granville W.
1883 Early Cattle Trade of Nevada. Ms. Nevada Historical Society.

Hug, Proctor R.
1944 The Development of the High School in Nevada. M.A. Thesis, University of Nevada, Reno.

Ingalls, Nena.
n.d. Historic Landmarks in My Vicinity. Ms. Nevada Historical Society.

Inter-Tribal Council of Nevada.
1976a Newe: A Western Shoshone History. Salt Lake City: University of Utah Printing Services.

Inter-Tribal Council of Nevada.
1976b Numa: A Northern Paiute History. Salt Lake City: University of Utah Printing Services.

Inter-Tribal Council of Nevada.
1976c Nuwuvi: A Southern Paiute History. Salt Lake City: University of Utah Printing Services.

Inter-Tribal Council of Nevada.
1978 Nevada History: The Nevada Indian Perspective. Typescript, University of Nevada, Reno.

Ione (Nev.) Silver Mines, Ltd.
Records 1888-1892. Bancroft.

Jackson, W. Turrentine.
1965 Wagon Roads West. (Revised Edition.) New Haven: Yale University Press.

Johnson, Hiram.
Correspondence, Papers and Business Records, 1879-1887. Nevada Historical Society.

Johnson, M. G.
1973 Placer Gold Deposits of Nevada. U.S. Geological Survey Bulletin 1356.

Joseph, Morris H.
The Mines and Resources of Eureka County, Nevada. Holograph, c. 1900, Nevada Historical Society.

King, Buster L.
1954 The History of Lander County, Nevada. M.A. Thesis, University of Nevada, Reno.

Kneiss, Gilbert H.
1954 Bonanza Railroads. (4th Rev. Edition). Stanford: Stanford University Press.

Knight, Oliver.
1973 Toward an Understanding of the Western Town. Western Historical Quarterly, January, 1973.

Koschmann, A. H. and M. H. Bergendahl.
1968 Principal Gold Producing Districts of the United States. U.S. Geological Survey Professional Paper 610 (1968). Washington, D.C.: Government Printing Office.

Kral, V. E.
1951 Mineral Resources of Nye County. University of Nevada Bulletin.

Kroeber, Alfred L.
1939 Cultural and Natural Areas of Native North America. Berkeley: University of California Press.

Kupper, Winifred.
1945 The Golden Hoof. New York: Knopf.

Kusunoki, Tom.
1961 The Peterson Ranch. Ms. Nevada Historical Society.

Laiola, Paul Robert.
1941 An Analysis of Nevada Banks During the Period 1934-1940. M.A. Thesis, University of Nevada, Reno.

Land, William C.
1888 The Cattle Industry in Arizona, New Mexico, Idaho and Nevada. Typescript, Bancroft.

Lander County, Nevada, Assessor.
Assessment Rolls 1891-92. Nevada State Archives.

Lander County, Nevada.
Cortez Mining District. Claims, 1863-1914.
University of Nevada, Reno.

Lander County, Nevada, Recorder.
Lander County Records, Books 19-24 (February 9, 1864-May 10, 1865). University of Nevada, Reno.

Lander County, Nevada.
Reese River Mining District. Records, Books D-E, 1863-64. University of Nevada, Reno.

Lass, W. E.
1972 From the Missouri to the Great Salt Lake: An Account of Overland Freighting. Lincoln: Nebraska State Historical Society.

Lawrence, E. I.
1963 Antimony Deposits of Nevada. Nevada Bureau of Mines and Geology Bulletin 61.

Lewis, Marvin.
1970 Hot Creek and the Wide Gray Valley. Nevada Historical Society Quarterly 13(2): 41-54.

Lincoln, Francis Church.
1923 Mining Districts and Mineral Resources of Nevada. Reno: Nevada Newsletter Publishing Co.

Lincoln, F. C. and R. C. Horton.
Outline of Nevada Mining History, 1855-1923, 1924-1964. Nevada Bureau of Mines, Report #7.

Lincoln Highway Association.
1935 The Lincoln Highway. New York: Dodd, Mead.

Lingenfelter, Richard E.
1974 The Hardrock Miners: A History of the Mining Labor Movement in the American West, 1863-1893. Berkeley: University of California Press.

Long, Walter S.
Sketchbooks (1870's, Eureka area). University of Nevada, Reno.

Malin, James C.
1967 The Grassland of North America. Gloucester, Massachusetts: Peter Smith.

Manhattan Gold Dredging Project . . . Making New Nevada History. Nevada Magazine 2: 29-32.

Manhattan Consolidated Gold and Silver Mines, Ltd. Records, 1887-1892. Bancroft.

Manhattan Freehold Gold and Silver Mining Co., Ltd. Records 1885-1894. Bancroft.

Manhattan, Nevada.
1906 Scrapbook. Nevada Historical Society.

Manhattan Silver Mining Co. of Nevada. Correspondence and Papers 1863-1887. Bancroft.

Mathews, James G. and Co.
1889 Austin, Nevada. Assay Book. University of Nevada, Reno.

Maupin, Michon.
1961 From Trails to Freeways. Ms. Nevada Historical Society.

McCourt, Thomas. Battle Mountain, Nevada. Account Book, 1895-1905. University of Nevada.

McKee, Harley J.
1973 Introduction to Early American Masonry. Washington, D.C.: National Trust for Historic Preservation.

McKenney, L. M.
1877 Business Directory of San Francisco and Principal Towns of California and Nevada. San Francisco.

McKenney, L. M.
1881 Pacific Coast Directory, 1880-1881. San Francisco.

McNeely, James.
1931 Historical Landmarks. Ms. Nevada Historical Society.

McNeely, John T.
1898 The Cattle Industry of Colorado, Wyoming and Nevada, and the Sheep Industry in Colorado, in 1897. U.S. Department of Agriculture, Bureau of Animal Industry, Annual Report 15: 377-381.

Mellinger, Philip J.
1971 Frontier Camp to Small Town: A Study of Community Development. Annals of Wyoming (Fall, 1971).

Merrifield, Robert Brent.
1957 Nevada 1859-1881: The Impact of an Advanced Technological Society upon a Frontier Area. Ph.D. Dissertation, University of Chicago.

Merrill, George Whitney.
1887 Biography of George Whitney Merrill. San Francisco. Bancroft.

Miller, Eunice.
1926 The Timber Resources of Nevada. Nevada Historical Society Papers 5: 375-457.

Miner, H. Craig.
The Corporation and the Indian: Tribal Sovereignty and Industrial Civilization in Indian Territory, 1865-1907. Columbia: University of Missouri Press.

Minnesota Historical Society.
1980 Minnesota Farmscape: Looking at Change. St. Paul: Minnesota Historical Society.

Mordy, B. D. and D. L. McCaughey.
1968 Nevada Historical Sites. Reno: Desert Research Institute.

Molinelli, Lambert, & Co.
1879 Eureka and its Resources, a Complete History of Eureka County, Nevada . . . San Francisco: H. Keller & Co.

Monroe, Alonzo.
Letters to wife, Ann, 1863-1869. Nevada Historical Society.

Moore, Lyman.
1971 Economic Evaluation of California-Nevada Iron Resources and Iron Ore Markets. U.S. Bureau of Mines Information Circular 8511.

Morrissey, F. R.
1968 Turquoise Deposits of Nevada. Nevada Bureau of Mines and Geology Report 17.

Mulloy, William T.
1938 Groups of Central and Southern Nevada, in Willard Z. Park et al. Tribal Distribution in the Great Basin. American Anthropologist 40: 630-632.

Murdoch, George P.
1941 Enthnographic Bibliography of North America. New Haven: Yale University Press.

Myrick, David F.
1962 Railroads of Nevada and Eastern California. Vol. I: The Northern Roads. Berkeley: Howell-North Books.

Mynch,
1963 Railroads at Nevada and Eastern California. Vol. II: The Southern Roads. Berkeley: Howell-North Books.

Nason, Allura.
1964 The Basques: Sheepmen of the West. M.A. Thesis, University of Nevada, Reno.

Nevada Central Railroad Co.
Business Records, 1880-1890. University of Nevada.

Nevada Farm Prices, 1920-1945.
1946 Reno: Nevada Agricultural Experiment Station.

Nevada Federation of Women's Clubs.
Correspondence . . . Records . . . Publications, 1913-1972. Nevada Historical Society.

Nevada. Office of the Labor Commissioner.
Biennial Reports.

Nevada. Secretary of State.
Biennial Reports 1865-

Nevada State Association of Architects.
Records, Papers and Correspondence, 1939-1950. Nevada Historical Society.

Nevada. State Bank Examiner.
Biennial Reports, 1908-1944.

Nevada. State Board of Agriculture.
Biennial Reports, 1885-

Nevada State Cattle Association.
Beaver to Beef. Carson City: Nevada State Cattle Association, 1949.

Nevada. State Engineer.
Biennial Reports, 1903/04.

Nevada. Superintendent of Public Instruction.
Biennial Reports 1865-

Nevada. Surveyor General and State Land Register.
Annual Reports 1865-1890.

Nevada, University of.
1935 College of Agriculture, Agricultural Extension Service. Annual Narrative Reports of Extension Activities by County Farm Bureaus.

Nevada from Dirt Roads to Divided Paved Four Lanes.
1953 Nevada Highways and Parks 13: 3-30.

Nevada's Agricultural Industry.
1939 Nevada Highways and Parks 4: 1-17.

Nevada's Ranges Produce High Quality Food Animals.
1947 Nevada Highways and Parks 7: 3-17.

Newman, Linda.
1969 Early Public Libraries of Nevada. Research ms., University of Nevada, Reno.

Nolam, Thomas B.
1962 The Eureka Mining District, Nevada (in cooperation with the Nevada State Bureau of Mines), U.S.G.S. Professional Papers #406. Washington, D.C.: Government Printing Office.

Norcross, Charles A.
1911 Agricultural Nevada. San Francisco: Sunset Magazine Homeseekers Bureau.

Norcross, Charles A.
1914 Dairying in Nevada . . . Nevada Bureau of Industry, Agriculture and Irrigation Bulletin 9.

Nye County, Nevada, Assessor.
Assessment Rolls, 1891-1892. Nevada State Archives.

Nye County, Nevada, Fairplay Mining District.
Mining Records, Books C & E, 1905-1909. University of Nevada, Reno.

Nye County, Nevada, Livestock Brand Records 1913-1922. Nevada Historical Society.

Nye County, Nevada. Records, Papers and Correspondence, 1865-1949. Nevada Historical Society.

Nye County, Nevada. Union Mining District. Records 1875-1894. University of Nevada, Reno.

Oberbillig, Ernest.
1967 Development of Washoe and Reese River Silver Processes. Nevada Historical Society Quarterly 10: 6-43.

O'Neill, James A.
1976 Charcoal Industry of the West. Typescript.

Order of the Eastern Star, Austin, Nevada. Electra Chapter #2, Records, 1904-1936. Nevada Historical Society.

Overland Stage Line. Letters and Papers, 1856-64. Nevada Historical Society.

Palmer, William R.
1958 Early Day Trading with Nevada Mining Camps. Utah Historical Quarterly 26: 353-368.

Paul, Rodman Wilson.
1963 Mining Frontiers of the Far West. New York: Holt, Rinehart and Winston.

Pelzer, Louis.
1936 The Cattleman's Frontier, 1850-1890. Glendale, Calif.: A. H. Clark.

Peters, Lillian B.
1947 Settlement Patterns of Nevada. M.A. Thesis, University of Chicago.

Peterson, Richard H.
1977 The Bonanza Kings: The Social Origins and Business Behavior of Western Mining Entrepreneurs, 1870-1900. Lincoln: University of Nebraska Press.

Pittsburgh Consolidated Gold Mines, Ltd. Records 1887-1892. Bancroft.

Polk, R. L.
1908 R. L. Polk's Nevada State Gazetteer and Business Directory, 1907-1908.

Powell, J. W. and G. W. Ingalls.
1873 Report, 18 December 1863. In Annual Report of the Commissioner for Indian Affairs.

Ranching and Cattle Growing. Ms., n.a., Nevada Historical
n.d. Society.

Rand, McNally & Co.
1885 Indexed Atlas of the World. Chicago: Continental Publishing Co.

Reese River Reveille.
Special Industrial and Mining Number, January 1910.

Reese River Silver Mining Co., Ltd.
Records 1865-1883. Bancroft.

Reichman, Frederick W.
1967 Early History of Eureka County, Nevada 1863-1890. M.A. Thesis, University of Nevada, Reno.

Rice, C. T.
1906 Tonopah, Nevada. Engineering and Mining Journal 82: 106.

Rifkind, Carole.
1980 A Field Guide to American Architecture. New York: New American Library.

Roberts, R. J. and D. C. Arnold.
1965 Ore Deposits of the Antler Peak Quadrangle, Humboldt and Lander Counties, Nevada. U.S. Geological Survey Professional Paper 459B.

Roberts, R. J., K. M. Montgomery, and R. E. Lehner.
1967 Geology and Mineral Resources of Eureka County, Nevada. Nevada Bureau of Mines and Geology Bulletin 64.

Robertson, Frank Chester and Beth Kay Harris.
1962 Boom Towns of the Great Basin. Denver: Sage Books.

Rocha, Guy Louis.
1977 Radical Labor Struggles in the Tonopah-Goldfield Mining District, 1901-1922. Nevada Historical Society Quarterly 20(1): 3-45.

Ross, Clyde P.
n.d. The Geology and Ore Deposits of Reese River District, Lander County, Nevada; Geologic Study of One of Old Bonanza Silver Camps. U.S.G.S. Bulletin, #997. Washington, D.C.: Government Printing Office.

Ross, Silas E.
1957 A Directory of Nevada Medical Practitioners Past and Present.

Round Mountain Banking Corporation.
Records and Papers, 1907-1911. Nevada Historical Society.

Ruby Hill Railroad Co.
1879 Annual Report, University of Nevada, Reno.

Ruhlen, George.
1964 Early Nevada Forts. Nevada Historical Society Quarterly 7: 7-63.

Sadler, Reinhold.
Papers. Nevada Historical Society.

Sargent, Charles S.
1879 The Forests of Central Nevada. American Journal of Science and Arts (3rd Series), Vol. 17, No. 102: 417-429.

Sawyer, Byrd Wall.
1971 Nevada Nomads: A Story of the Sheep Industry. San Jose: Harlan-Young Press.

Shannon, Fred A.
1945 The Farmers' Last Frontier. (Economic History of the United States). New York: Farrar and Rinehart.

Shaw, E. J. and P. Shaw.
Papers and Correspondence, 1907-1914. Nevada Historical Society.

Shawe, F. R., Reeves, R. G. and V. E. Kral.
1962 Iron Ore Deposits of Northern Nevada. Nevada Bureau of Mines and Geology, Bulletin 53C.

Shepperson, Wilbur Stanley.
1970 Restless Strangers: Nevada's Immigrants and their Interpreters. Reno: University of Nevada Press.

Shields, Fred.
1933 Research Notes for Banking in Nevada . . . A History. Nevada Historical Society.

Shields, Fred.
1953 Banking in Nevada . . . A History. Ms. prepared for First National Bank of Reno. Nevada Historical Society.

Shinn, Charles Howard.
1965 Mining Camps: A Study in American Frontier Government. New York: Harper Torchbooks.

Shirley, James Quincy.
1885 Recollections. Bancroft.

Short, Shelton H.
1965 A History of the Nevada Livestock Industry Prior to 1900. M.A. Thesis, University of Nevada, Reno.

Silver Star Mining Co., Ltd.
Records 1871-1884. Bancroft.

Simpson, James H.
1876 Report of Explorations Across the Great Basin of the Territory of Utah for a Direct Wagon-Route from Camp Floyd to Genoa, in Carson Valley in 1859. Washington, D.C.: Government Printing Office.

Smart, George W.
1958 Mission to Nevada. Ph.D. Dissertation, Central Baptist Theological Seminary.

Smith, Duane A.
1967 Rocky Mountain Mining Camps. Lincoln: University of Nebraska Press.

Smith, Rodney.
1963 Austin, Nevada, 1862-1881. M.A. Thesis, University of Nevada, Reno.

Smith, Wells C.
1949 Battle Mountain. Nevada Magazine 4: 23-29.

Smythe, William Ellsworth.
1905 The Conquest of Arid America. New and Revised Edition. New York: McMillan Co.

Spaulding, Franklin Spencer.
Incomplete Journal, 1905-1911. Nevada Historical Society.

Spence, Clark C.
1958 British Investments and the American Mining Frontier, 1860-1901. Ithaca, New York: Cornell University Press for the American Historical Association.

Spence, Clark C.
1980 The Golden Age of Dredging: The Development of an Industry and its Environmental Impact. Western Historical Quarterly 11(4): 401-414.

Stager, Harold K.l
1977 Mineral Deposits, in Geology and Mineral Deposits of Lander County. Nevada Bureau of Mines and Geology, Bulletin 88.

Steward, Julian Haynes.
1941 Culture Element Distributions: 13. Nevada Shoshoni. Anthropological Records 4(2): 209-359.

Steward, Julian H.
1958 Basin-Plateau Sociopolitical Groups. Washington, D.C.

Stewart, Omer Call.
1941 Culture Element Distributions: 14. Northern Paiute. Anthropological Records 4(2):361-446.

Stoehr, C. Eric.
1975 Bonanza Victorian: Architecture and Society in Colorado Mining Towns. Albuquerque: University of New Mexico Press.

Stokes, Anson Phelps.
Papers. Nevada Historical Society.

Stokes Family.
Letters, Correspondence and Business Records, 1875-1949. Nevada Historical Society.

Tagert, F. G.
n.d. Notes and Map on the History of the Pony Express and Location of Nevada Stations. Ms., Nevada Historical Society.

Tagert, Irene.
1949 Incredible Austin. Nevada Magazine 4: 1-14, 30.

Tallman, S. and Co., Belmont, Nevada. Records 1875-1879. Nevada Historical Society.

Thomas, David H.
Historic and Prehistoric Land-Use Patterns at Reese River. Nevada Historical Society Quarterly 14 (4): 3-10.

Thomas, Heather Smith.
1979 The Wild Horse Controversy. S. Brunswick and New York: A. S. Barnes & Co.

Thompson & West.
1876 Map of the States of California and Nevada . . . San Francisco. Bancroft.

Todd, Arthus Cecil.
1967 The Cornish Miner in America. Truro, England and Glendale, California: D. Bradford Barton, Ltd., and Arthur H. Clark Co.

Tonopah and Goldfield Railraod, Philadelphia.
Business Records and Papers, 1904-1949. Nevada Historical Society.

Torrence, Carl W.
1944 The History of Masonry in Nevada. Reno: published for the Grand Lodge F&AM of Nevada by Carlisle.

Towne, Charles W. and Edward N. Wentworth.
1945 Shepherd's Empire. Norman: University of Oklahoma Press.

Townley, John M.
1976 Reclamation in Nevada, 1850-1904. Ph.D. Dissertation, University of Nevada, Reno.

Trengove, R. R.
1959 Reconnaissance of Nevada Manganese Deposits. U.S. Bureau of Mines, Report of Investigations 5446.

Trenholm, Virginia C. and Maurine Carley.
1964 The Shoshonis: Sentinels of the Rockies. Norman: University of Oklahoma Press.

Trewartha, Glenn T.
1948 Some Regional Characteristics of American Farmsteads. Annals of the Association of American Geographers 38(3): 169-225.

Trout, Alice Frances.
1916 Religious Development in Nevada. M.A. Thesis, University of Nevada, Reno. (Also in Nevada Historical Society Papers 1 (1913-1916), 143-167).

Truett, Velma Stevens.
Correspondence and Papers, 1901-1967. Nevada Historical Society.

Tybo Consolidated Mining Co., Ltd.
Records 1874-1876. Bancroft.

Tybo Literary Society.
Records 1876-1881. Nevada Historical Society.

U.S. Army. Nevada.
Records 1858-1899. Nevada Historical Society.

U.S. Army. Corps of Engineers.
1875 Preliminary Report upon a Reconnaissance through Southern and Southeastern Nevada, made in 1869 by George M. Wheeler. Washington: U.S. Government Printing Office.

U.S. Bureau of the Census.
9th, 10th, 11th, 12th Censuses.

U.S. Department of the Interior.
National Archives Record Group 48 (includes letterbooks from the Pacific Railroad Surveys); Record Group 57, Geological Survey (includes Hayden Survey, King correspondence, Wheeler papers, reports of Powell Survey).

U.S. Department of the Interior, Bureau of Land Management.
1975 Bicentennial Action and Interim Recreation Management Plan.

U.S. Department of State.
Territorial Papers of Colorado, Nevada, New Mexico, Utah, Washington, and Wyoming, 1851-1874. Bancroft.

U.S. Office of the Chief of Engineers.
National Archives Record Group 77. Includes records of the Chief of Topographical Engineers (Pacific Railroad Reports) and part of the records of the Bureau of Exploration and Surveys.

U.S. Office of Indian Affairs.
Correspondence and Records, Stewart, Nevada, 1870-1962. Federal Records Center, San Francisco.

U.S. Office of Indian Affairs.
Letters Received OIA, Nevada Superintendency, 1861-1880. University of Nevada, Reno.

U.S. Office of Indian Affairs.
Letters Received OIA Utah Superintendency, 1849-1880. University of Nevada, Reno.

U.S. Office of Indian Affairs.
Selected Correspondence and Papers from the Utah Superintendency File, 1860-1870. Bancroft.

U.S. Office of Internal Revenue.
District of Nevada. Record of Brewers' Returns, 1880. University of Nevada, Reno.

U.S. Post Office. Berlin, Nevada.
Official Postmasters' Account and Record Book, 4th Class, for Post Office at Berlin, State of Nevada, 1903-08. University of Nevada, Reno.

URS/John A. Blume & Associates.
1977 Survey of Historic Sites: Southern Nevada and Death Valley. Draft Ms., San Francisco.

Vanderburg, William O.
1936 Placer Mining in Nevada. University of Nevada Bulletin (Bureau of Mines) 30(4).

Vanderburg, W. O.
1939 Reconnaissance of Mining Districts in Lander County, Nevada. U.S. Bureau of Mines Information Circular 7043.

Venstrom, Cruz.
1940 Railroad Grant Lands of Nevada. Reno: U.S. Bureau of Agricultural Economics.

Venstrom, Cruz and Howard Mason, comps.
1944 Agricultural History of Nevada. Ms., University of Nevada, Reno.

Vollmer, Edward and William Vollmer.
Correspondence and Records, 1868-1877, Edward Vollmer & Co., Belmont and Shermantown. Nevada Historical Society.

Watkins, T. H.
1971 Gold and Silver in the West. Palo Alto: American West Publishing Co.

Webb, Walter Prescott
1931 The Great Plains. New York: Grosset and Dunlap.

Weiss, Harry A.
1932 Some Observations on Desert Trails. Ms., Bancroft.

Welch, Patrick H.
1979 Historic Overview of the Shoshone-Eureka Resource Area. Bureau of Land Management, Battle Mountain District. Typescript.

Wells, Fargo & Co.
Correspondence and Papers, 1861-1883. Wells Fargo Bank, San Francisco.

Welton, E. W.
1867 Map of the Mining Districts of Reese River . . . Bancroft.

Wenban, Simeon.
Correspondence and Records, Cortez, Nevada, 1885-1891. University of Nevada, Reno.

Wentworth, Edward N.
1948 America's Sheep Trails. Ames: Iowa State University Press.

Wheeler, A. D.
Letters, Correspondence and Papers, 1904-1905. Nevada Historical Society.

Wheelock, Harrison.
1864 Guide and Map of Reese River and Humboldt . . . San Francisco: Towne and Bacon.

Whiffen, Marcus.
1969 American Architecture Since 1780. Cambridge: M.I.T. Press.

Williams, H. T.
1879 The Pacific Tourist: Williams' Illustrated Trans-Continental Guide of Travel, from the Atlantic to the Pacific Ocean. New York.

Williams, Tate.
n.d. Reminiscences of a Son of Eureka Pioneers . . . Ms., University of Nevada Oral History Project, Reno.

Wittwer, Eldon E.
1958 Financing Agriculture in Nevada. University of Nevada Agricultural Experiment Station Bulletin 200.

Wittwer, Eldon E.
1960 Nevada Agriculture. University of Nevada Agricultural Experiment Station Bulletin 210.

Wolcott, G. E.
1909 The Mines and Mills of Tonopah, Nevada. Engineering and Mining Journal 87: 594-597.

Woman's Silver League, Austin, Nevada.
Preamble and Resolutions Adopted 11 August 1893. University of Nevada, Reno.

Wooton, E. V.
1932 Public Domain of Nevada and Factors Affecting Its Use. Bureau of Agricultural Economics, Technical Bulletin #301.

Works Progress Administration.
1938 Inventory of the County Archives of Nevada. Reno: Historical Records Survey Project, 1937-38.

Works Progress Administration.
Papers and Records, 1935-40. Nevada Historical Society.

Wren, Thomas (ed.).
1904 A History of the State of Nevada, Its Resources and People. New York: Lewis Publishing Co.

Wyman, Walker D.
1945 The Wild Horse of the West. Caldwell, ID: Caxton Printers.

Young, James A. and Jerry R. Budy.
1979 Historical Use of Nevada's Pinyon-Juniper Woodlands. Journal of Forest History 23: 112-121.

Newspapers

Austin Sun.

Battle Mountain Messenger.

Battle Mountain Scout.

Belmont Mountain Champion.

Belmont Courier.

Eureka Sentinel.

Eureka Tri-Weekly Standard.

Manhattan Mail.

Manhattan News.

Manhattan Post.

Manhattan Times.

Nye County News (Ione).

Reese River Reveille (Austin).

Round Mountain Nugget.

Tonopah Bonanza.

Tonopah Daily Bonanza.

Tonopah Daily Times.

Tonopah Daily Times and Bonanza.

Tonopah Miner.

Tonopah Mining Reporter.

Tonopah Nevadan.

Tonopah Sun.

Tybo Weekly Sun.

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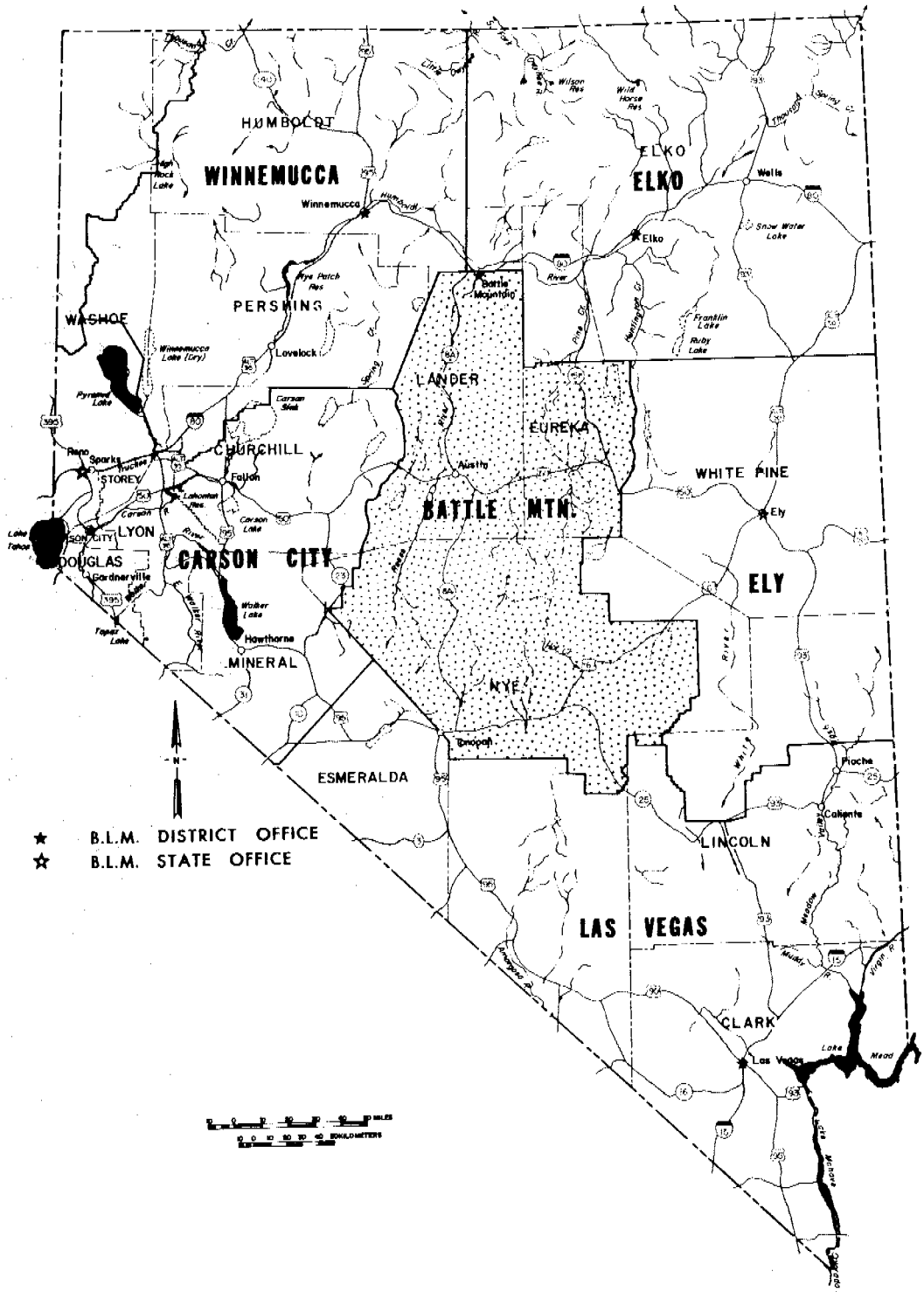
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